

KIC 012166874

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
012166874-01	OBS	No	475.468197	412.459468	504.4	3.646	9.5	8.0	1.00	6109	2.45	0.89
012166874-02	OBS	No	0.531637	131.642816	41.5	4.098	7.7	18.1	1.00	6109	0.76	7672.04

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012166874-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—CENT_FEW_DIFFS
012166874-02	OBS	FP	0.00	1	0	0	0	LPP_DV

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

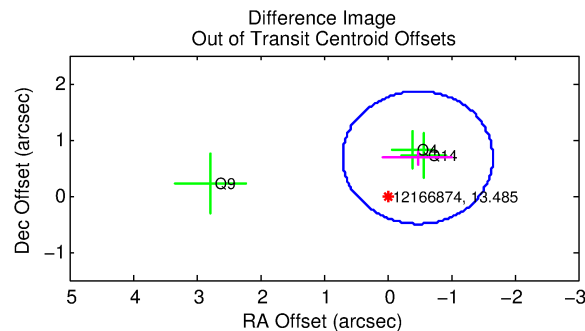
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012166874-01

No Significant Match Found

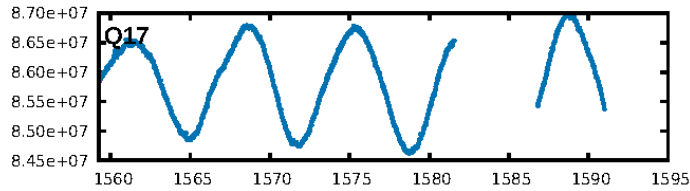
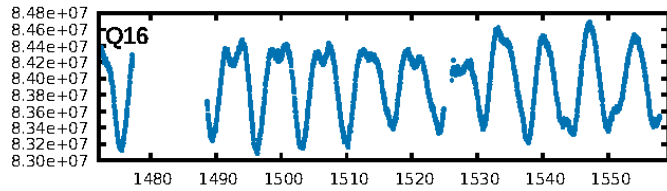
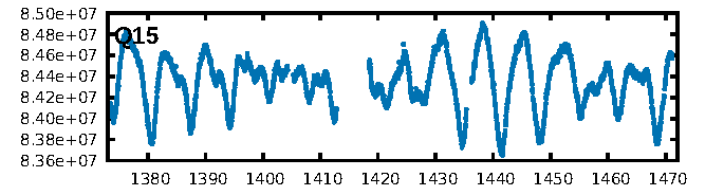
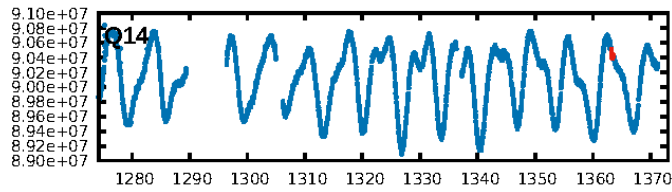
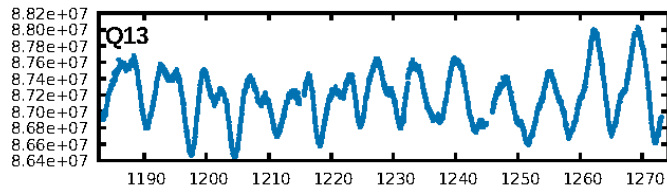
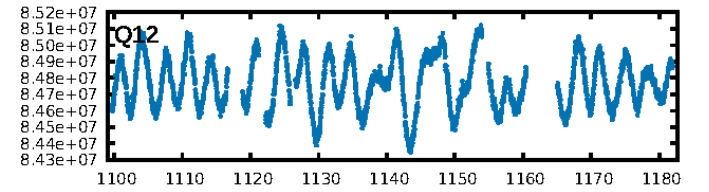
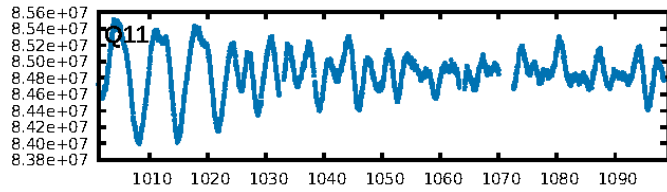
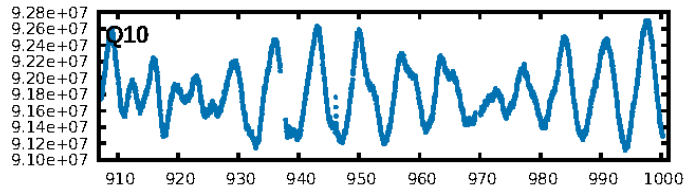
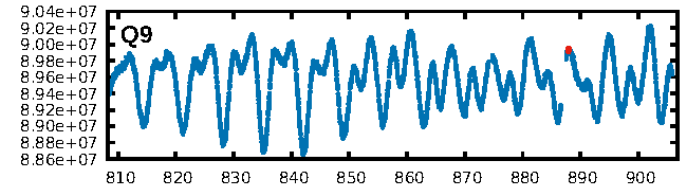
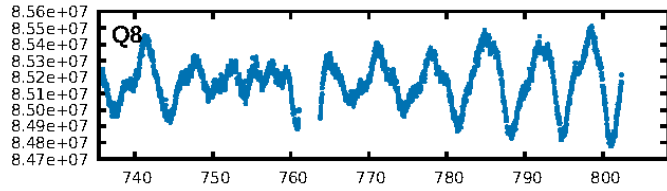
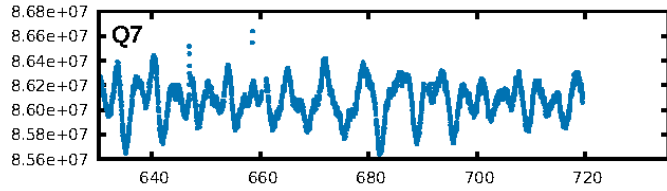
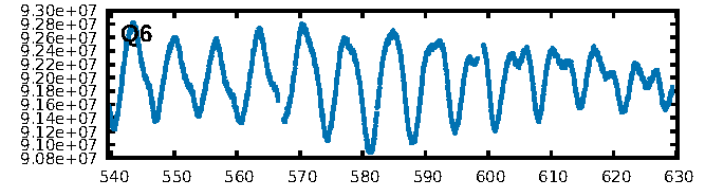
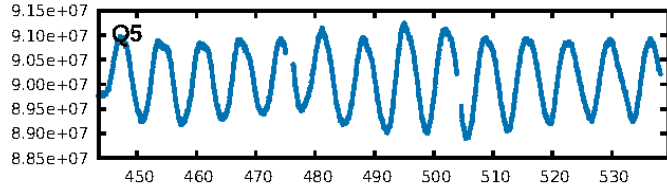
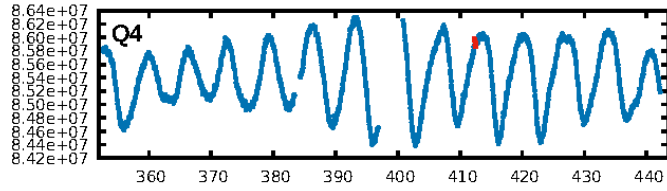
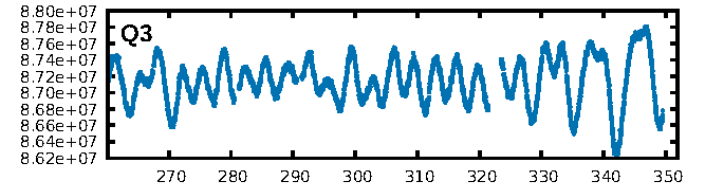
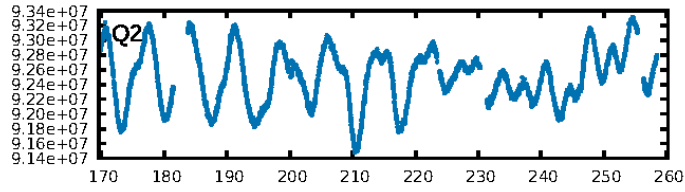
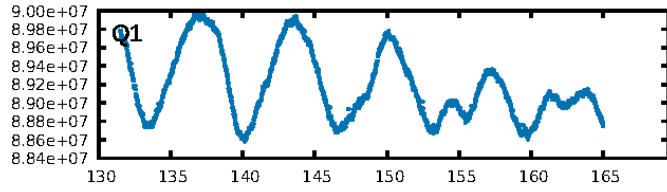
KIC: 12166874 Candidate: 1 of 2 Period: 475.468 d



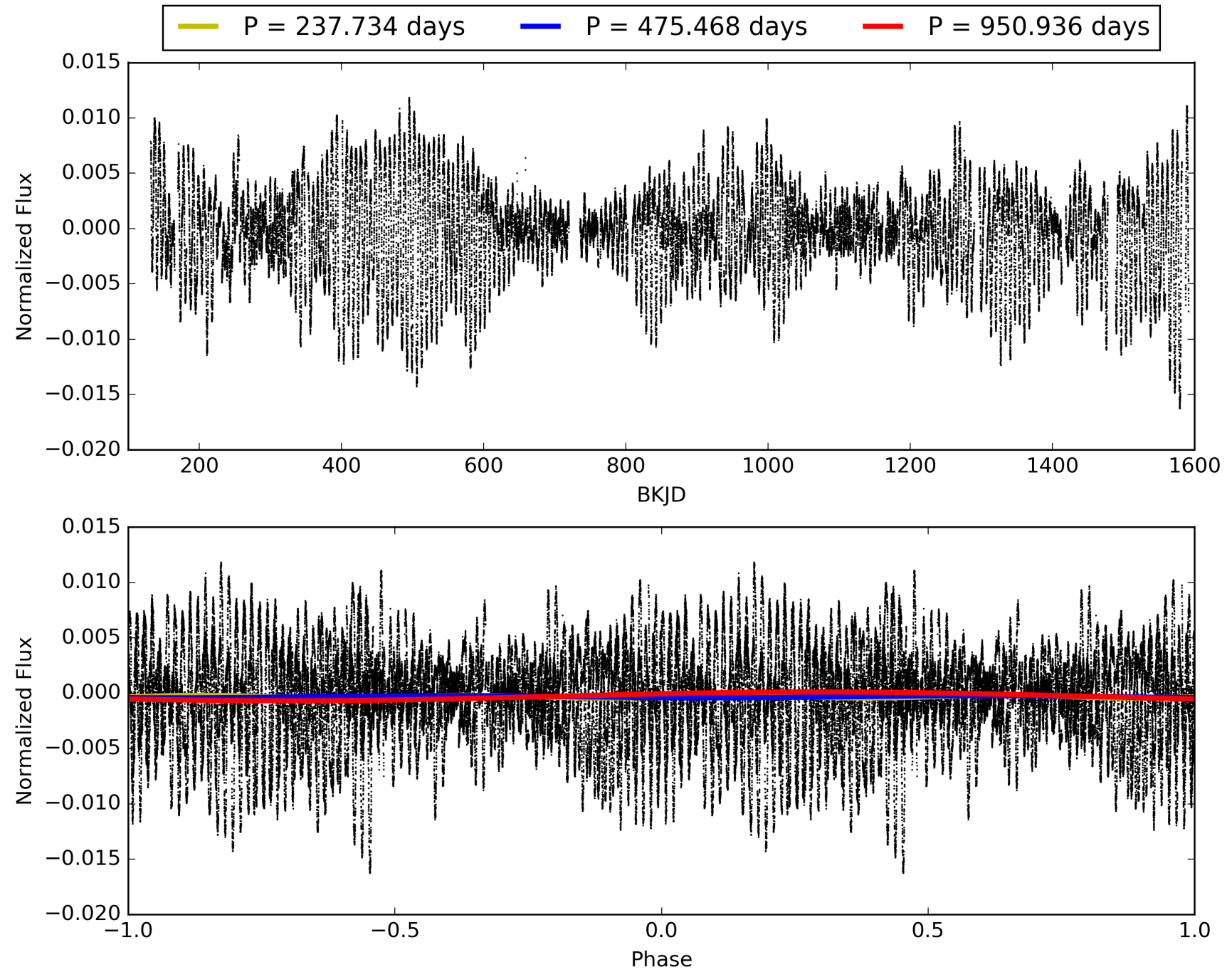
Centroid-sig: 56.7%
Centroid-so: 0.983 arcsec [0.67σ]
OotOffset-rm: 0.830 arcsec [2.11σ]
KicOffset-rm: 0.802 arcsec [1.07σ]
OotOffset-st: 1/0/1/1 [3]
KicOffset-st: 1/0/1/1 [3]
DiffImageQuality-figm: 0.67 [2/3]
DiffImageOverlap-fno: 0.00 [0/3]

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 012166874-01, PDC Light Curves

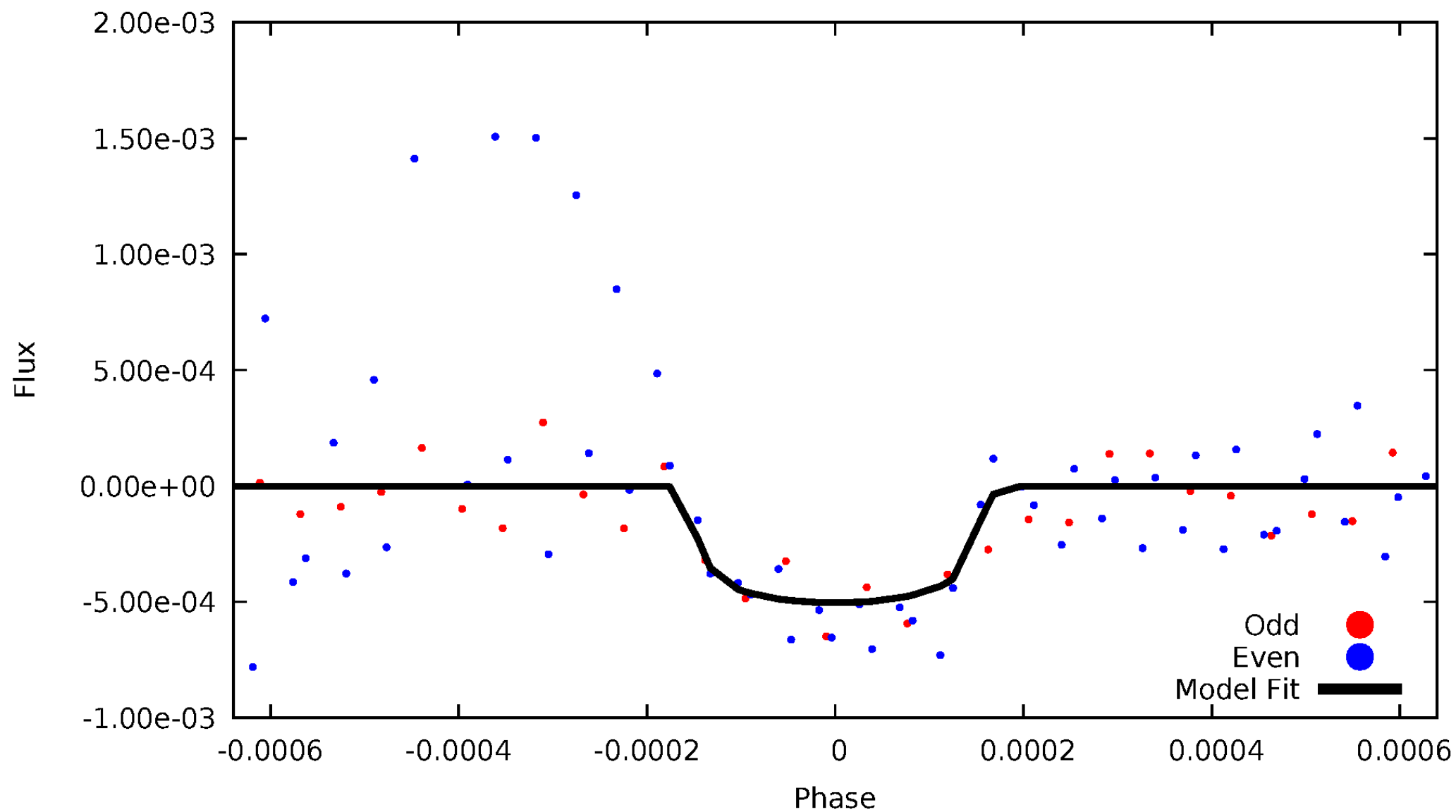


TCE 012166874-01



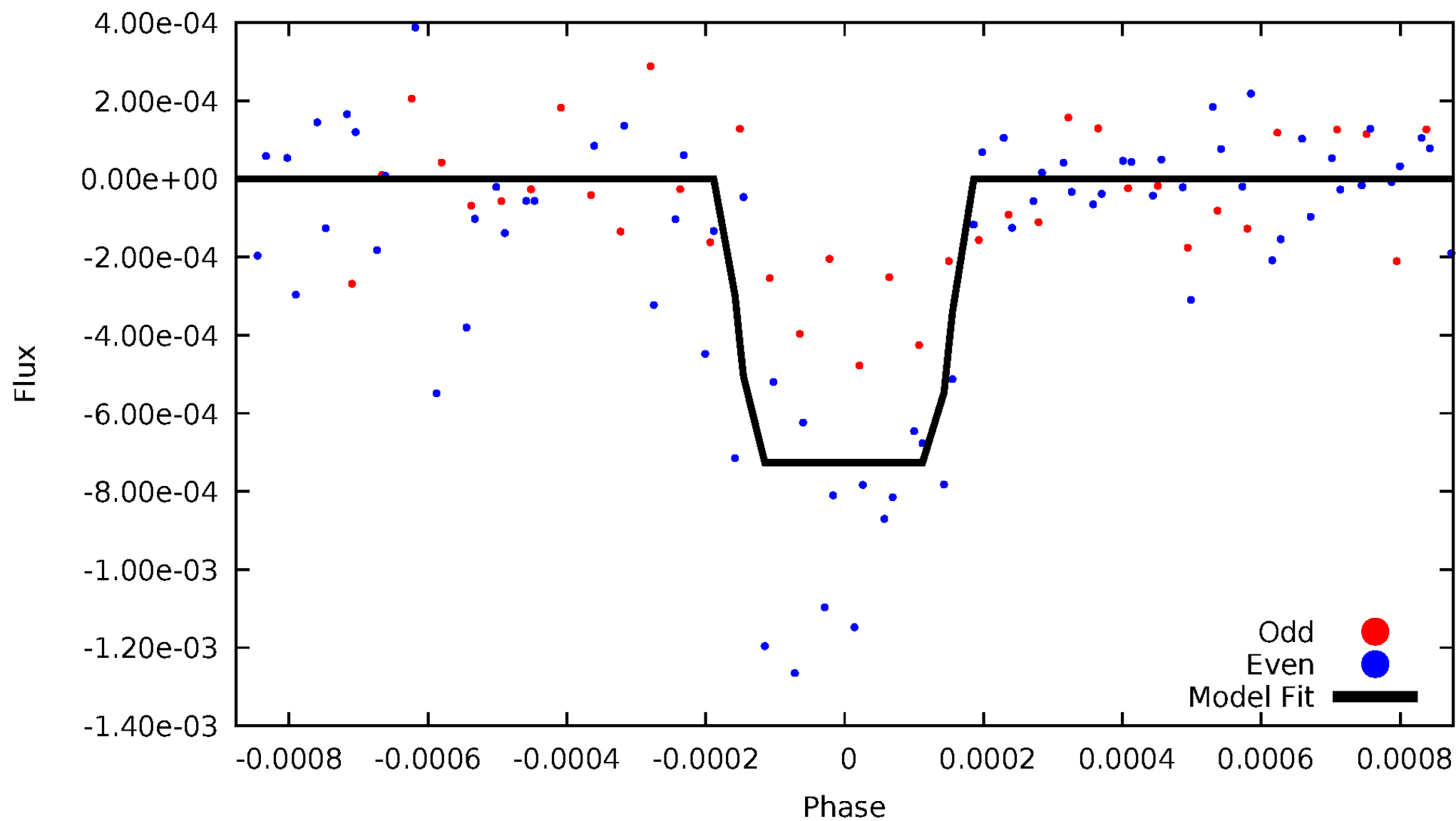
DV Odd/Even

TCE 012166874-01



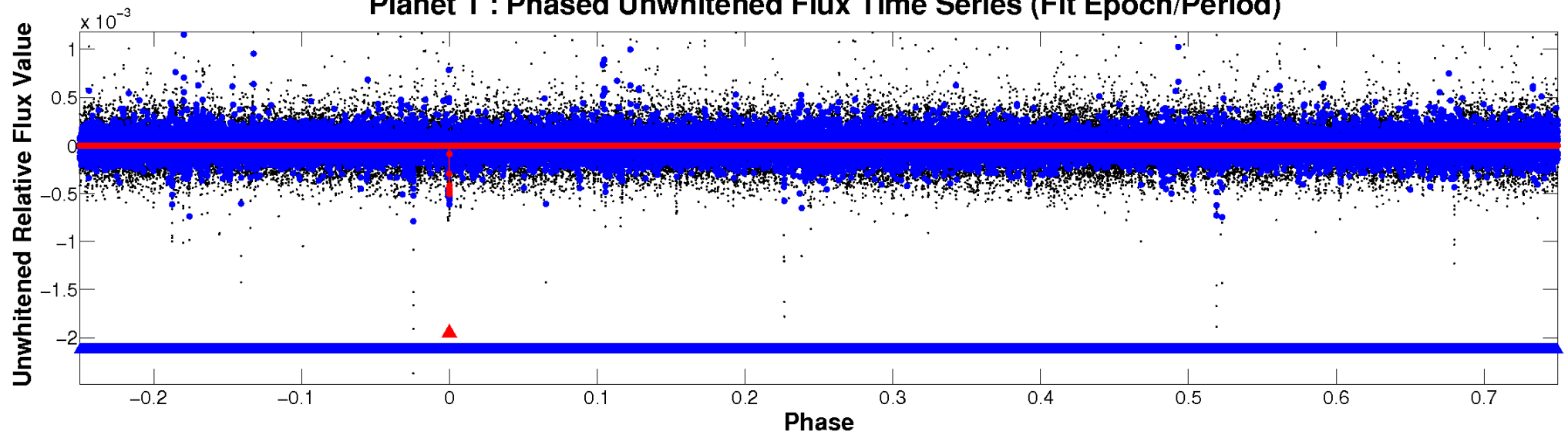
ALT Odd/Even

TCE 012166874-01

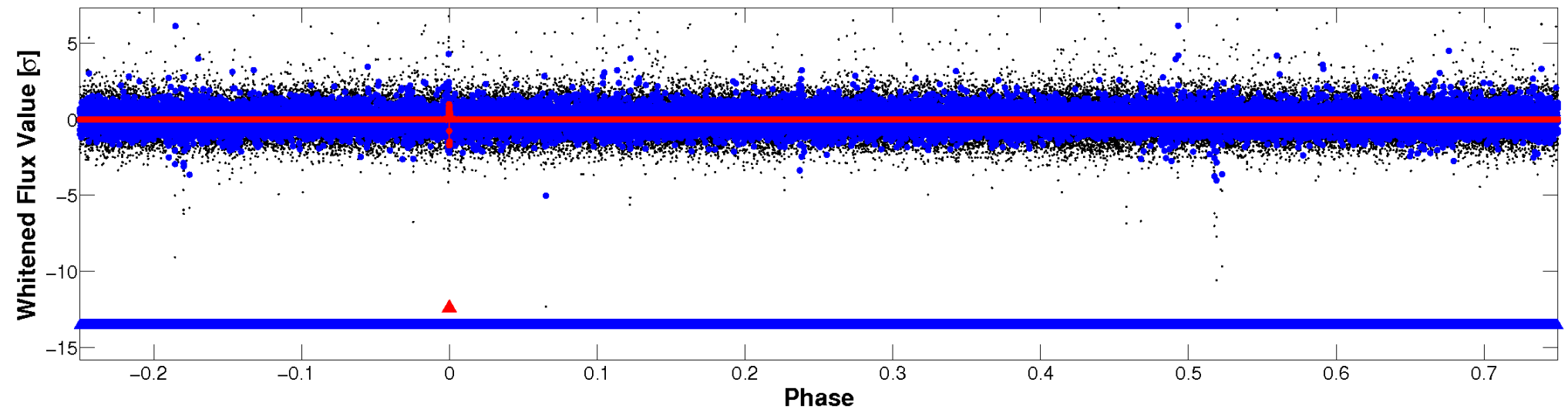


Non-Whitened Vs. Whitened Light Curve

Planet 1 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

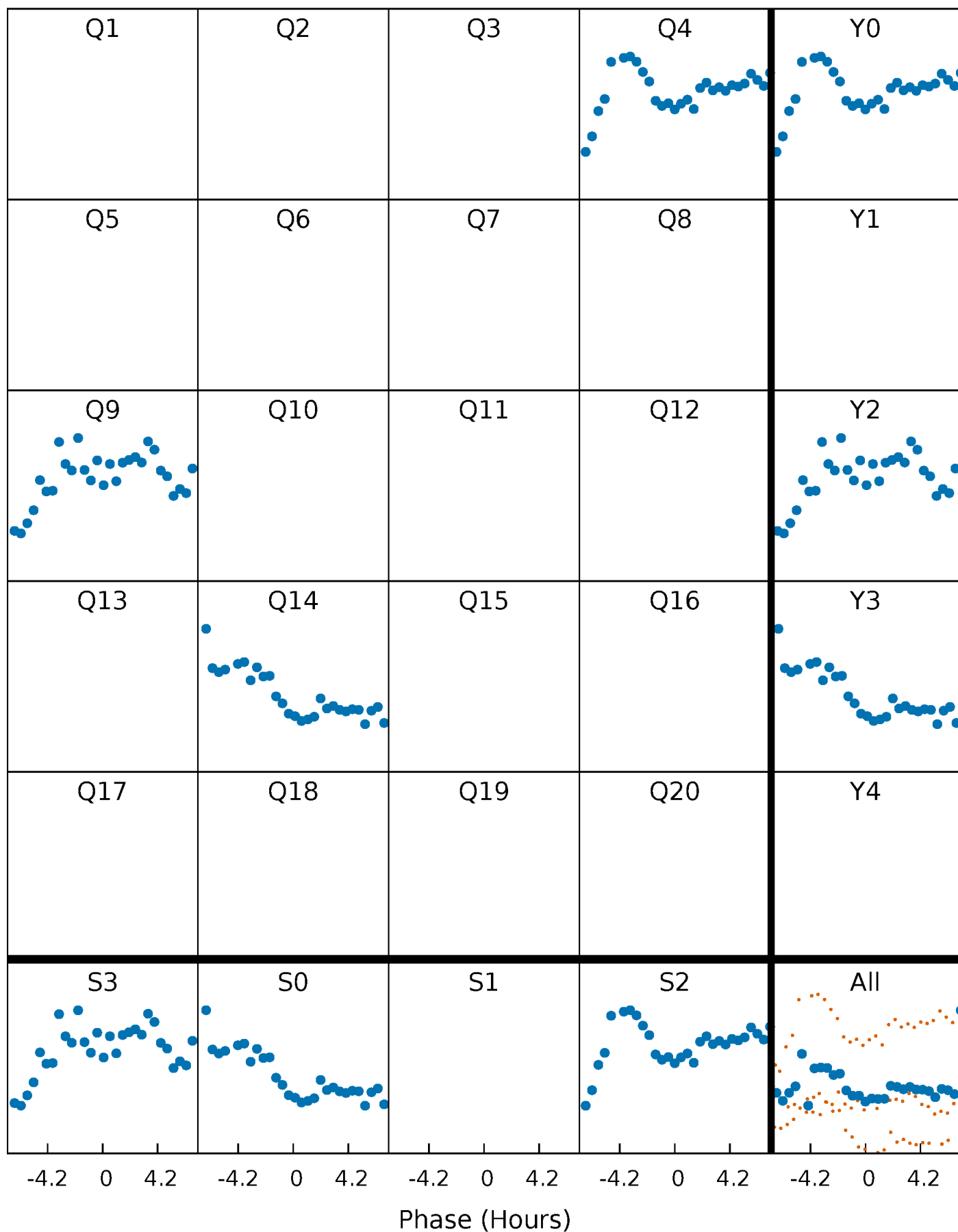


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



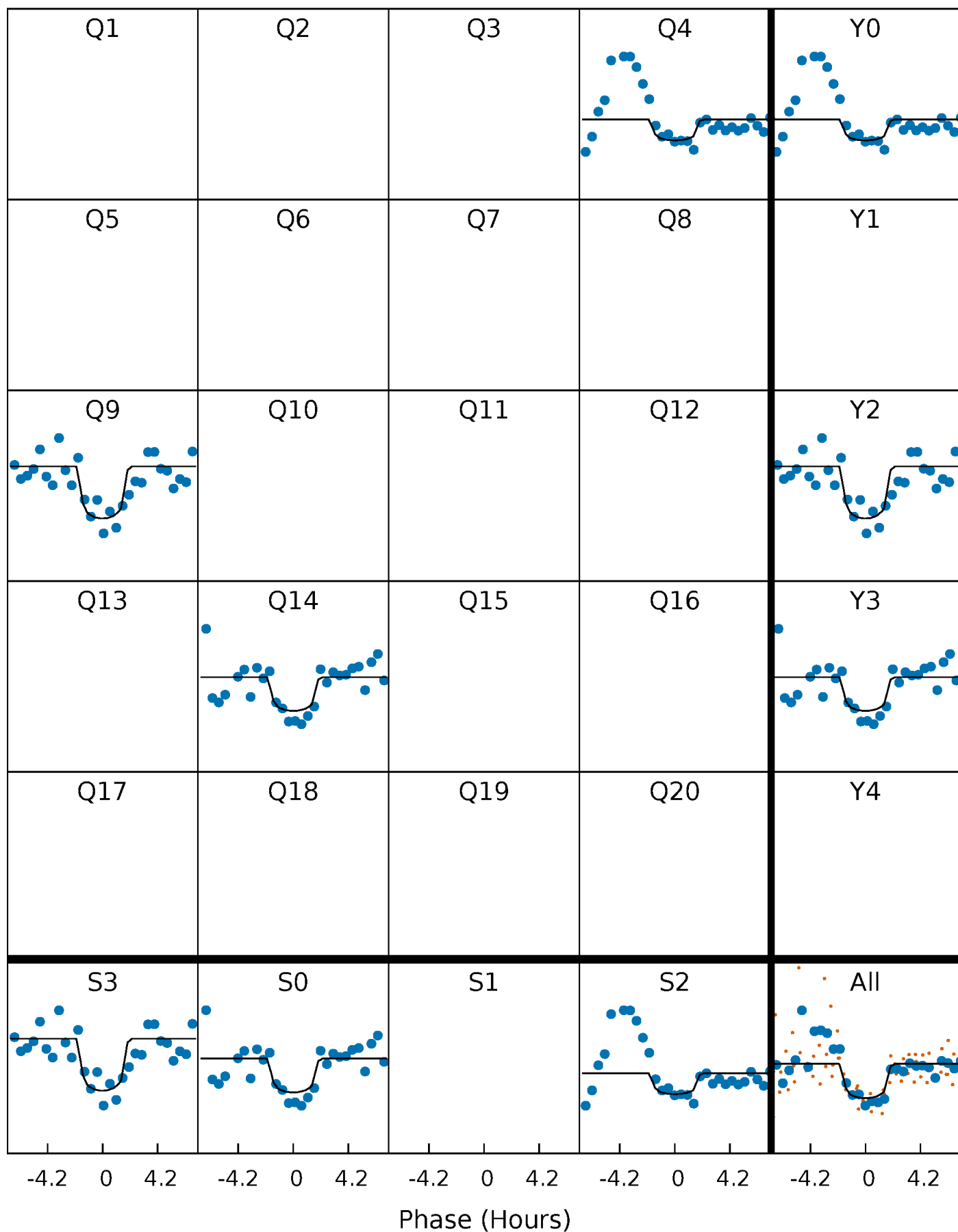
PDC Quarter-Phased Transit Curves

TCE 012166874-01 P=475.468197 Days $T_0=412.459468$ (BKJD)



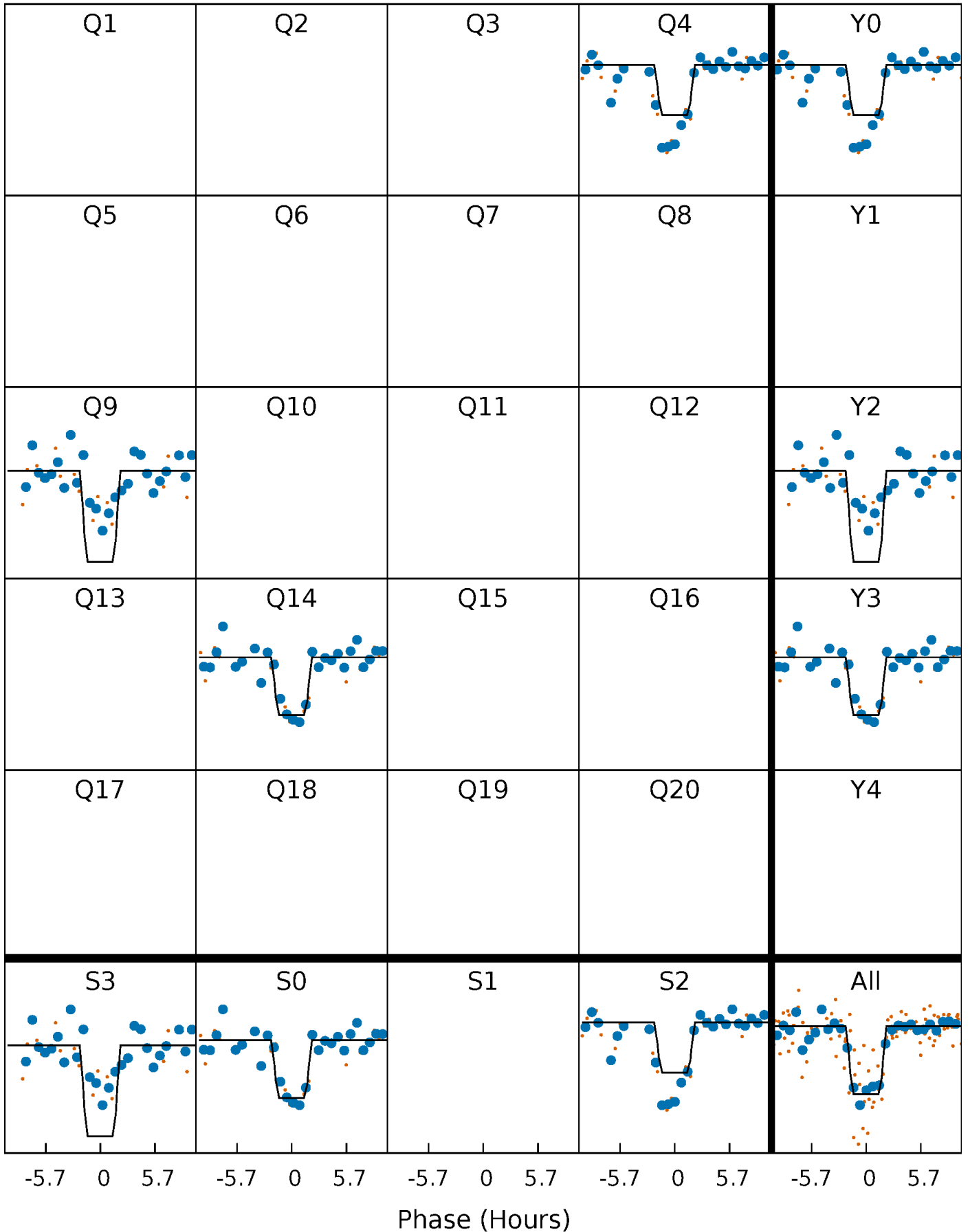
DV Quarter-Phased Transit Curves

TCE 012166874-01 P=475.468197 Days $T_0=412.459468$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

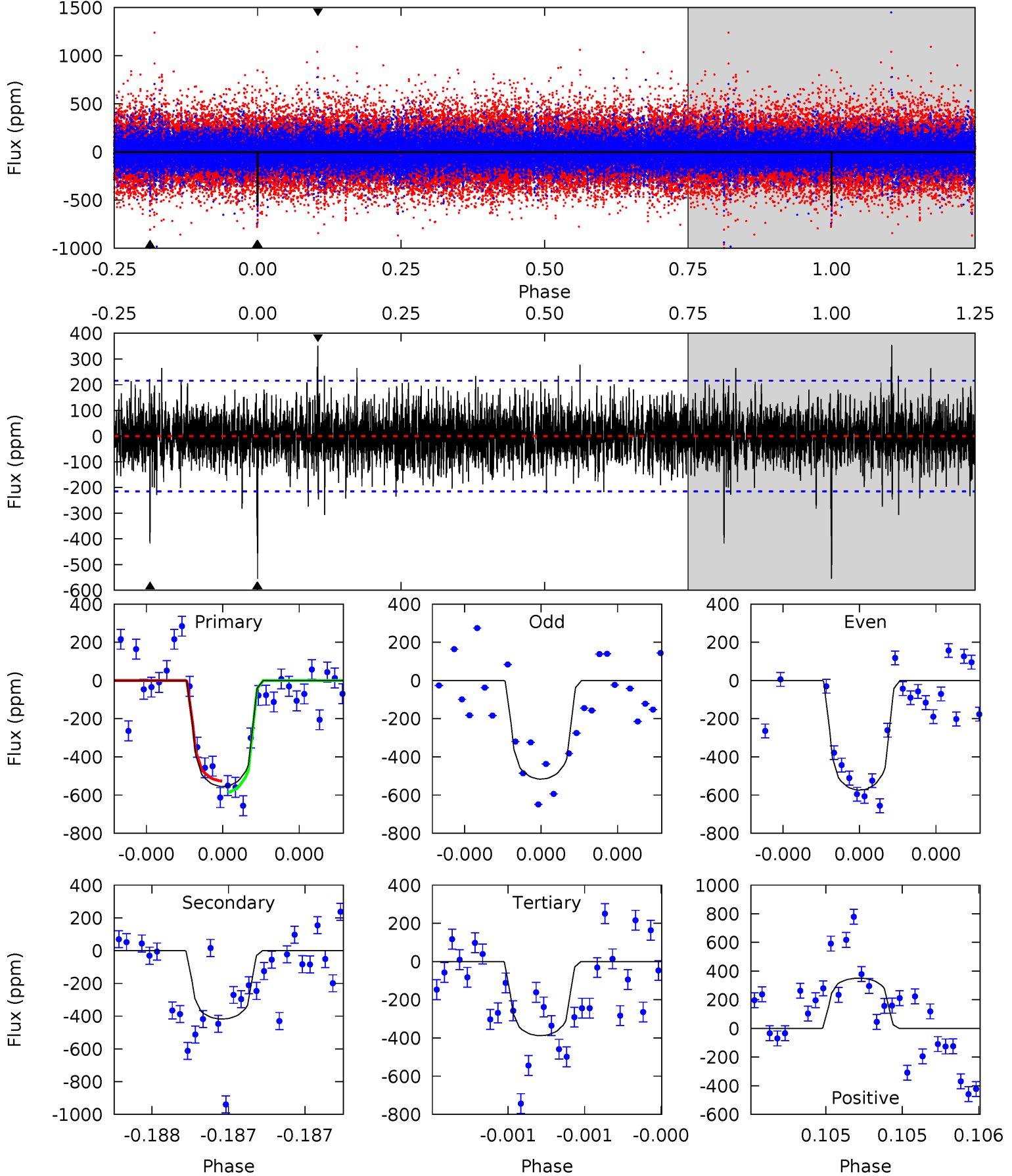
TCE 012166874-01 P=475.468508 Days $T_0=412.444531$ (BKJD)



DV Model-Shift Uniqueness Test

012166874-01, P = 475.468197 Days, E = 412.459468 Days

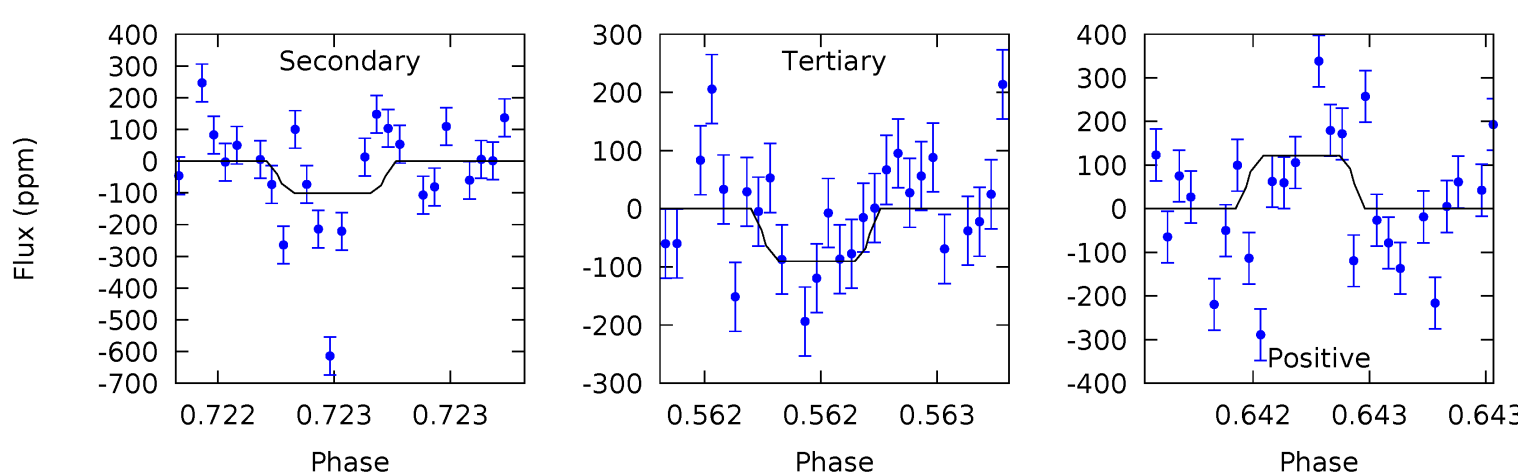
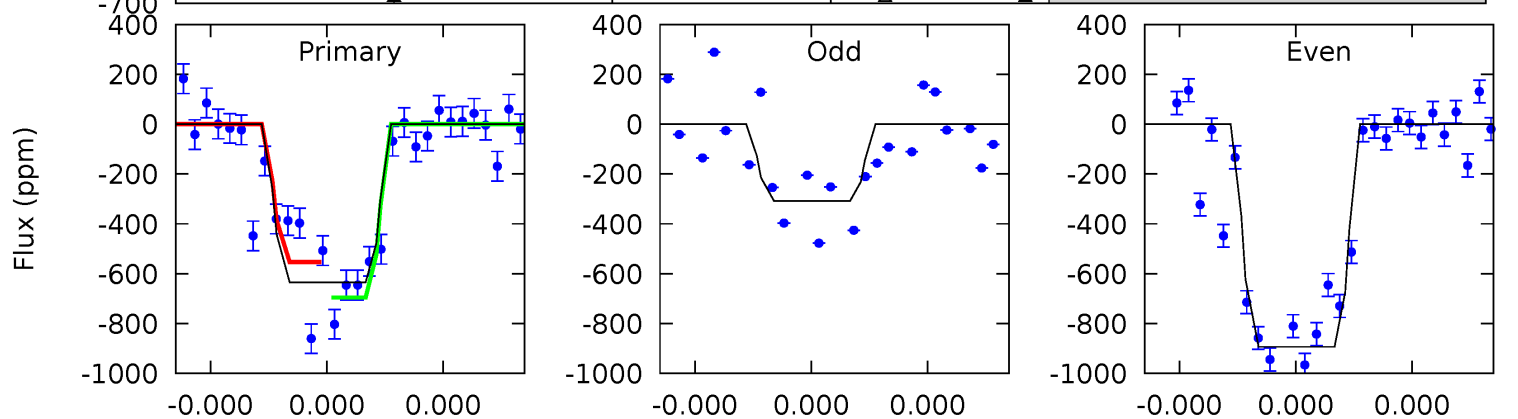
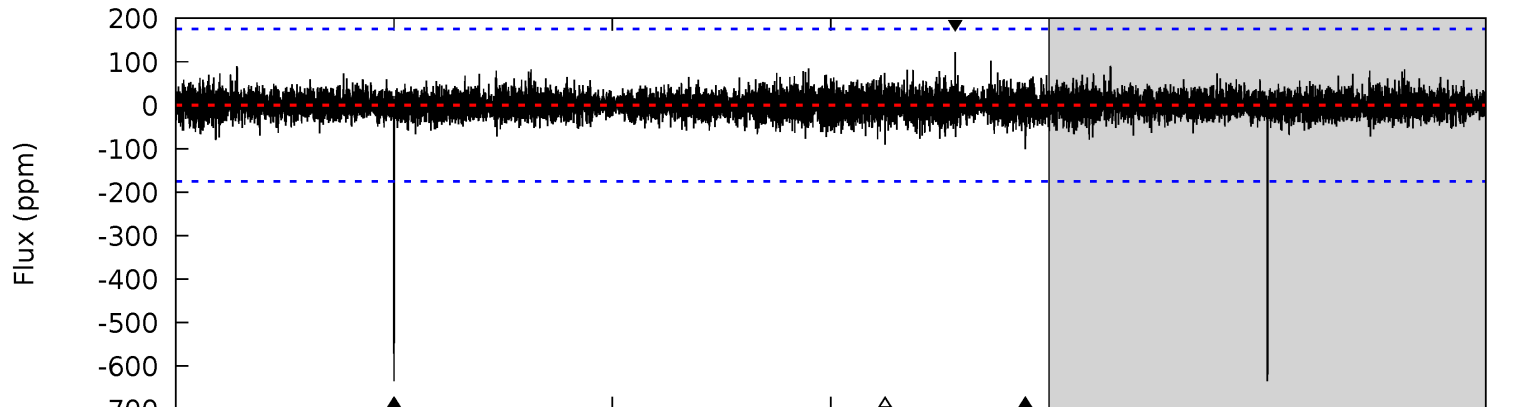
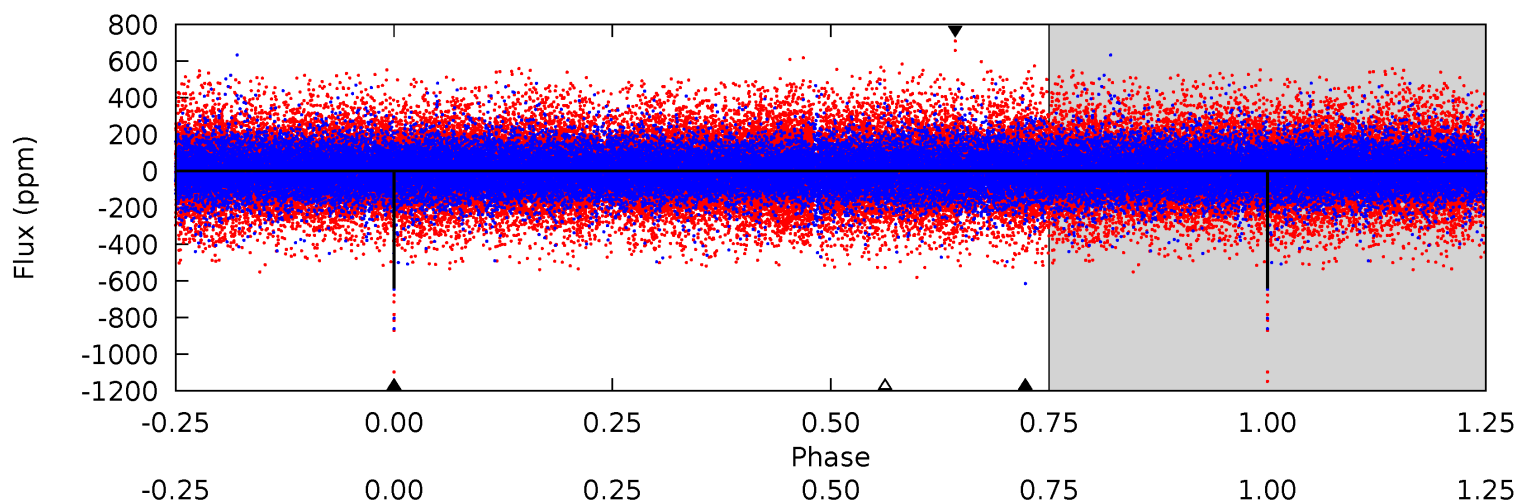
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.5	10.9	10.1	9.17	5.62	3.56	1.67	4.37	5.33	0.78	1.74	0.69	1.05	0.39	0.79



Alt Model-Shift Uniqueness Test

012166874-01, P = 475.468508 Days, E = 412.444531 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.4	3.24	2.91	3.92	5.64	3.59	0.62	17.5	16.5	0.33	-0.68	8.96	1.01	0.16	2.24



Stellar Parameters For KIC 012166874

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6109^{+164}_{-200}	$4.429^{+0.087}_{-0.203}$	$-0.280^{+0.300}_{-0.300}$	$1.001^{+0.307}_{-0.131}$	$0.979^{+0.141}_{-0.116}$	$1.377^{+0.523}_{-0.732}$
	+3%/-3%	+2%/-5%	+107%/-107%	+31%/-13%	+14%/-12%	+38%/-53%
Source	PHO1	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 012166874-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-418 ± 38	$3.33^{+2.88}_{-2.11}$	350^{+26}_{-19}	5107^{+3629}_{-1052}	$29720^{+183086}_{-21275}$
Alt.	-101 ± 31	$3.49^{+2.74}_{-2.17}$	352^{+25}_{-21}	3828^{+1763}_{-671}	6290^{+34858}_{-4553}

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming A=0.3)

A_{obs} = Observed Albedo (Assuming T=0)

If a secondary eclipse is present, the system is likely an EB if $T_{obs} \gg T_{max}$ AND $A_{obs} \gg 1.0$

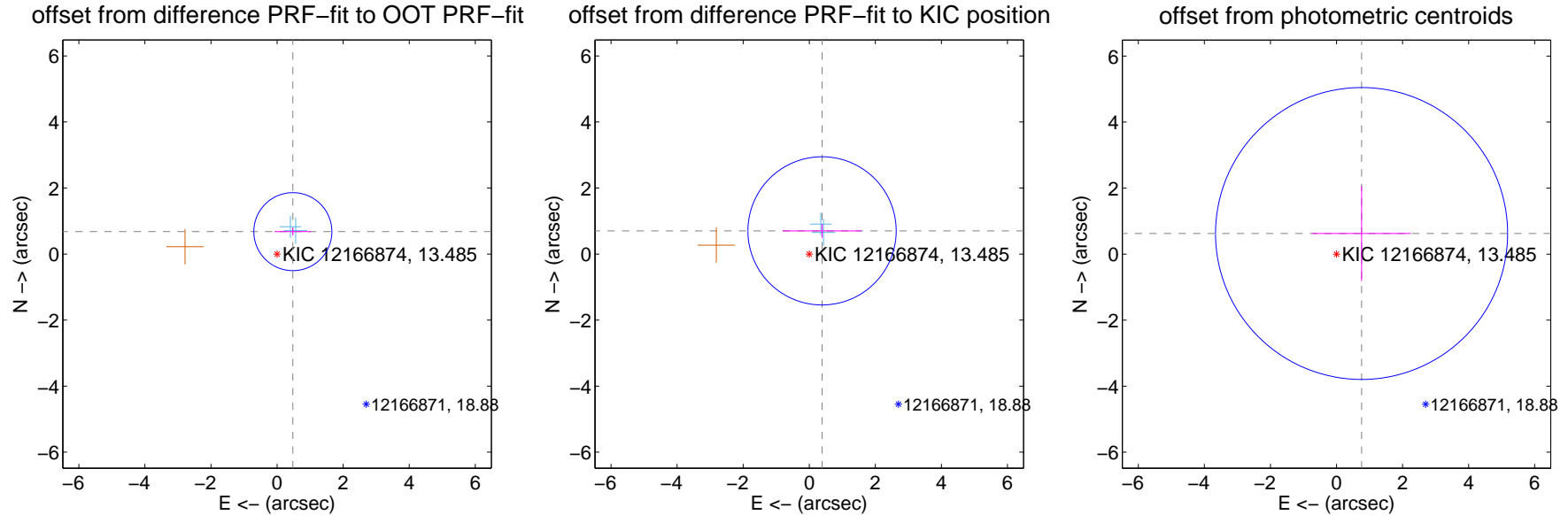
DV Centroid Data

Supplemental centroid analysis for 012166874-01. Kepler magnitude: 13.48. Transit SNR 7.97

There are 2 quarters with good PRF difference image offsets

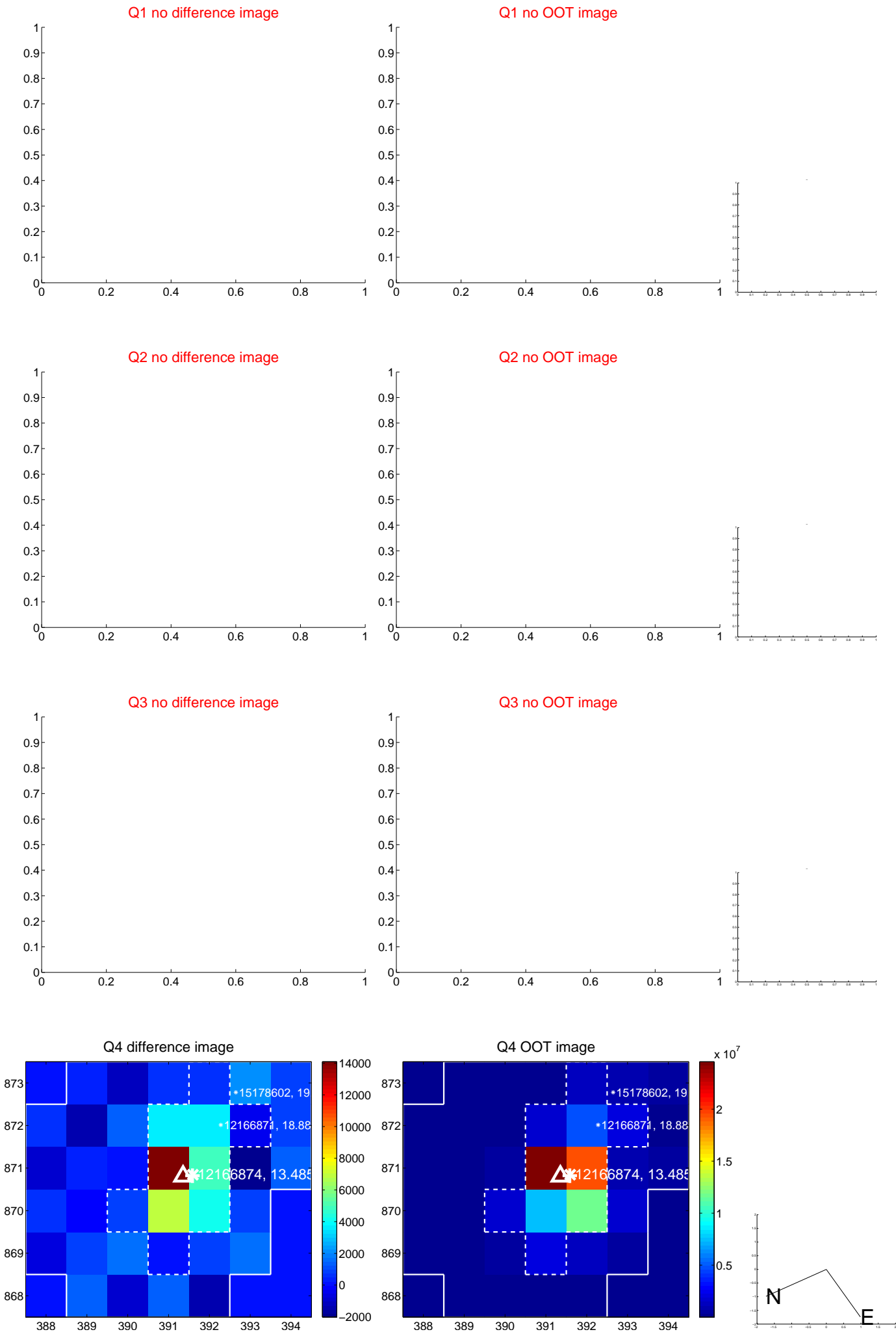
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.830 ± 0.394	2.11	-0.478 ± 0.550	0.678 ± 0.116
PRF-fit source offset from KIC position	0.802 ± 0.748	1.07	-0.387 ± 1.196	0.702 ± 0.214
photometric centroid source offset	0.98 ± 1.47	0.67	-0.76 ± 1.50	0.62 ± 1.44



Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

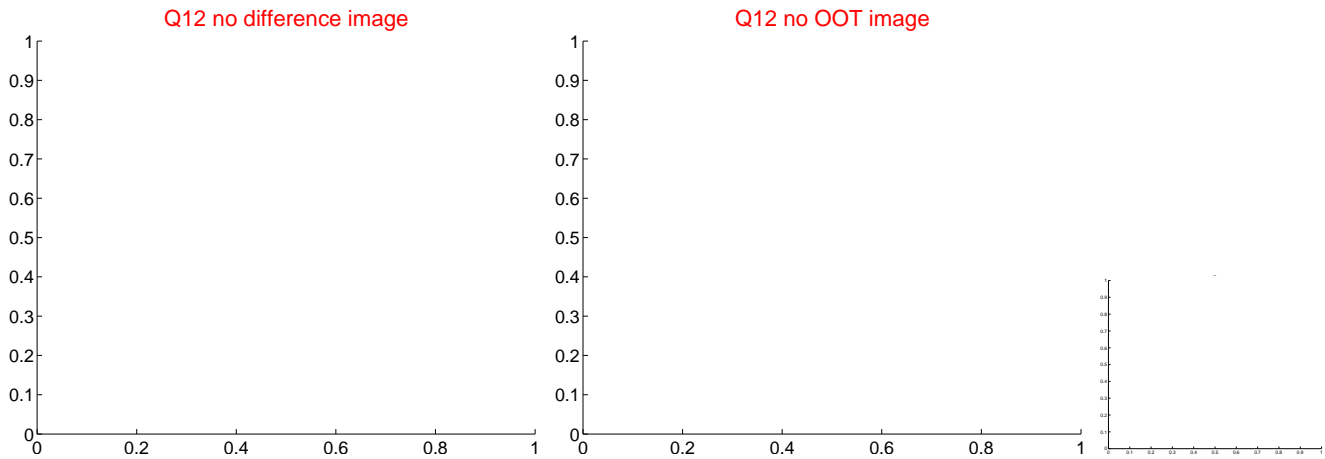
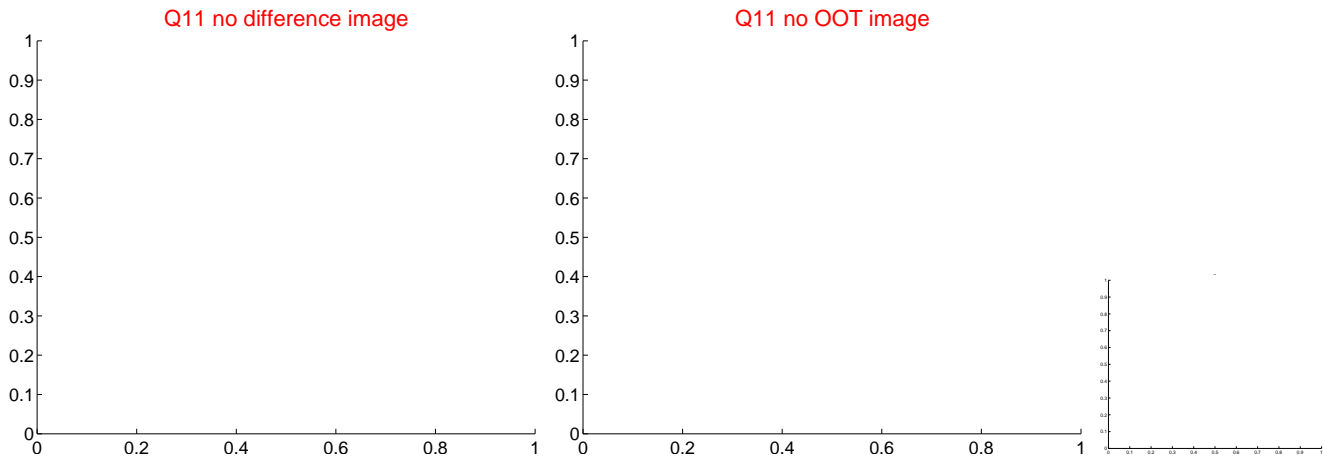
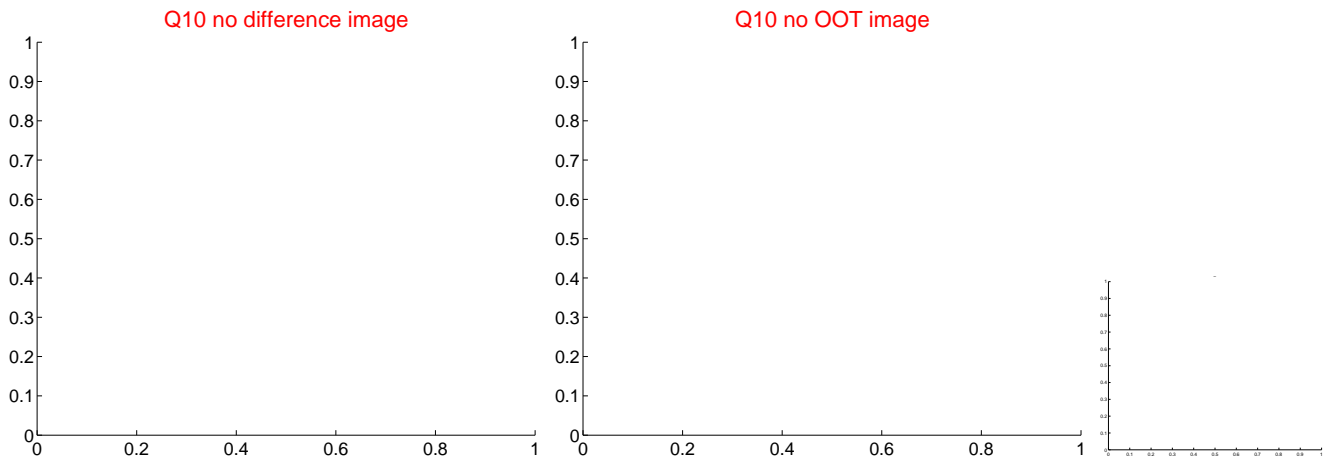
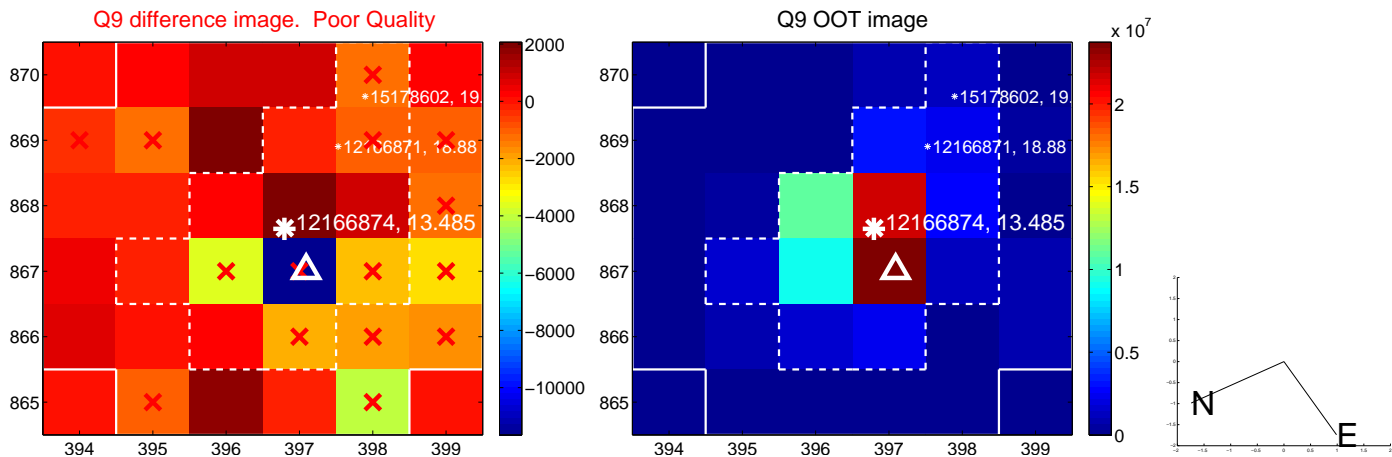
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



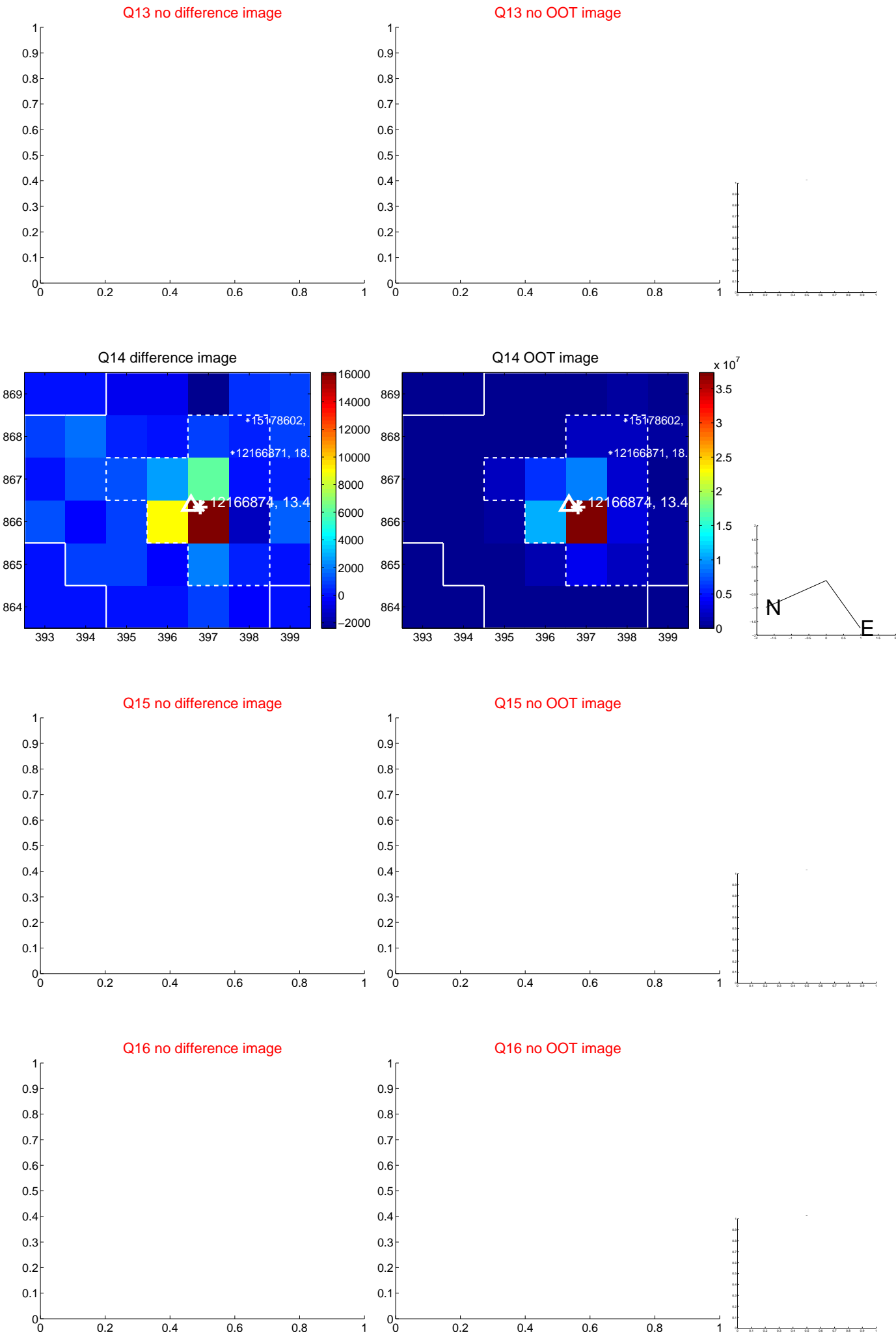
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



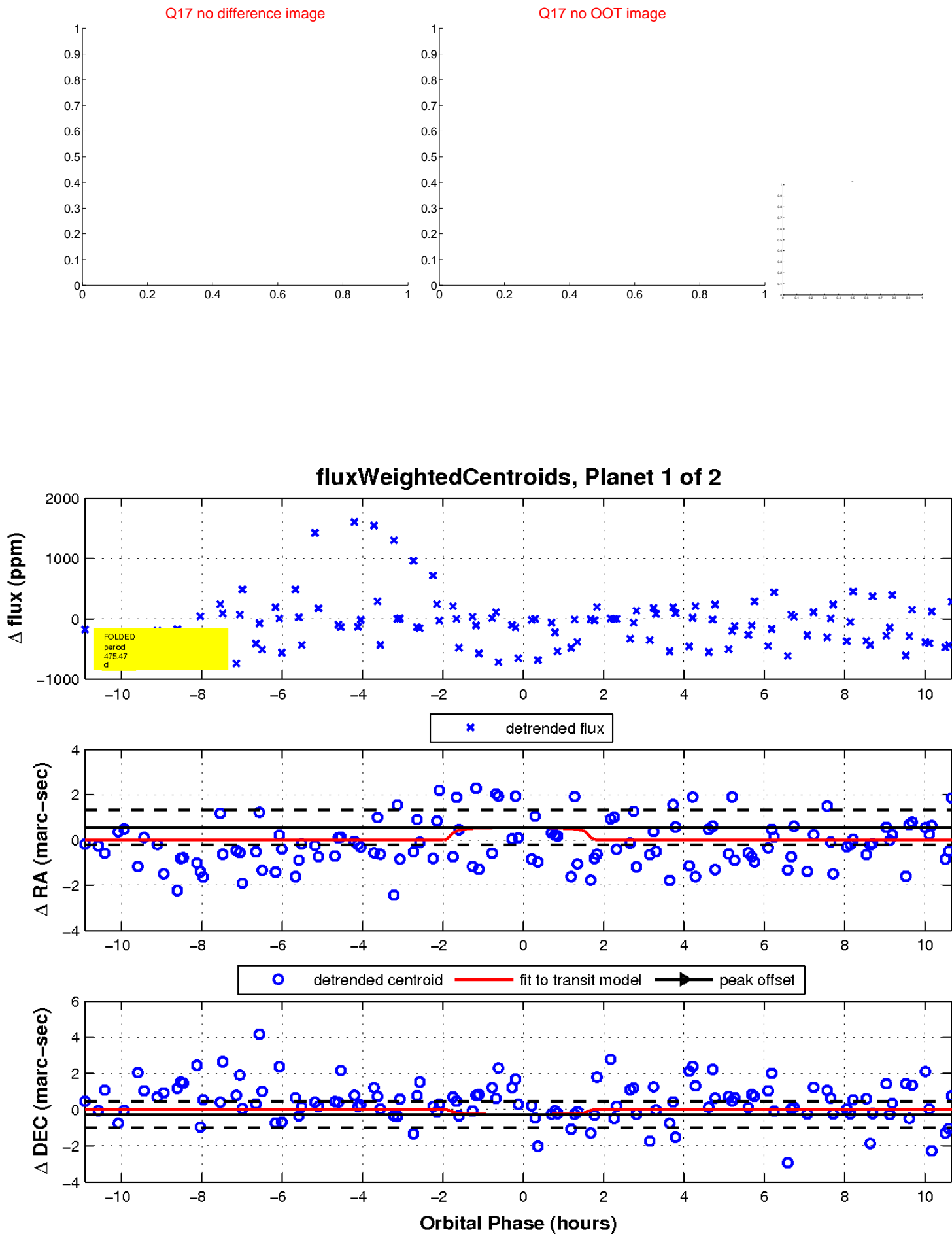
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

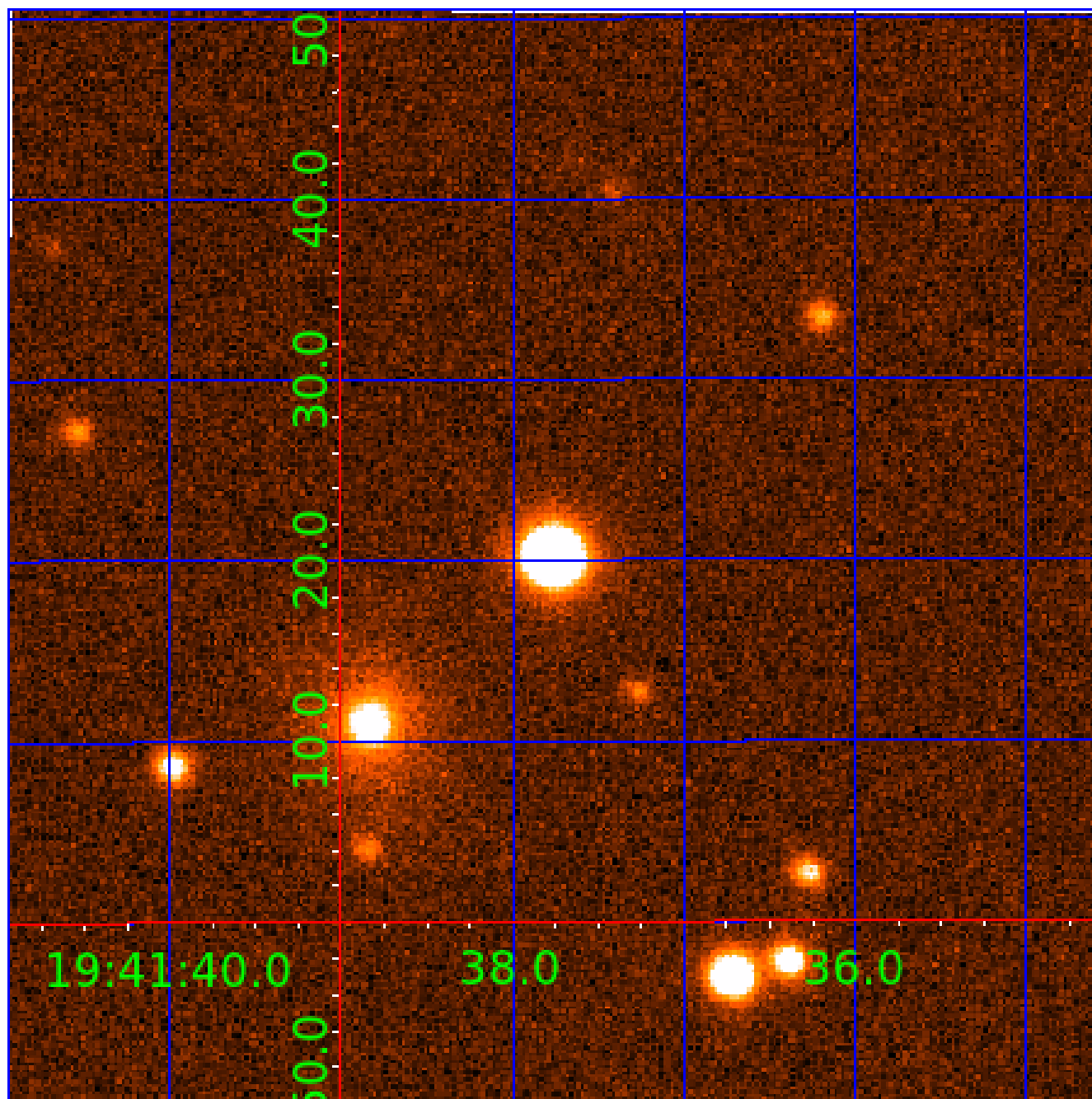


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 012166874

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
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Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012166874-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—CENT_FEW_DIFFS
012166874-02	OBS	FP	0.00	1	0	0	0	LPP_DV

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

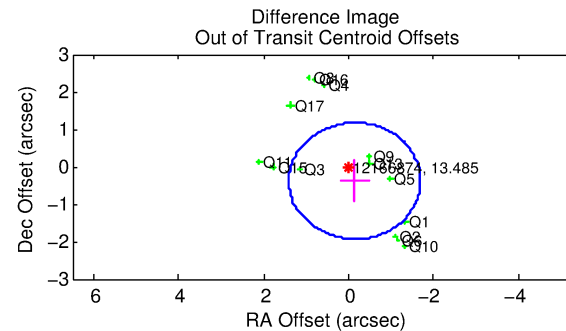
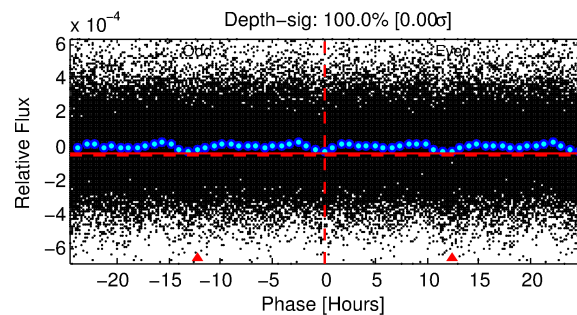
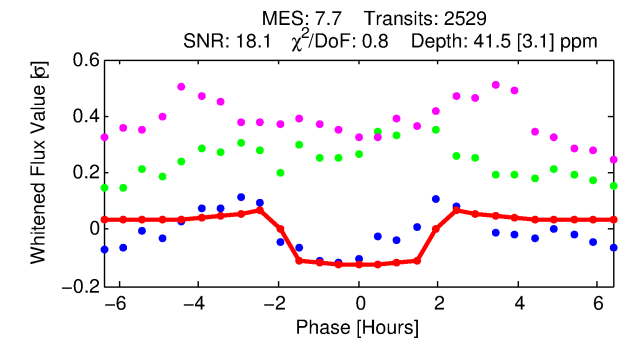
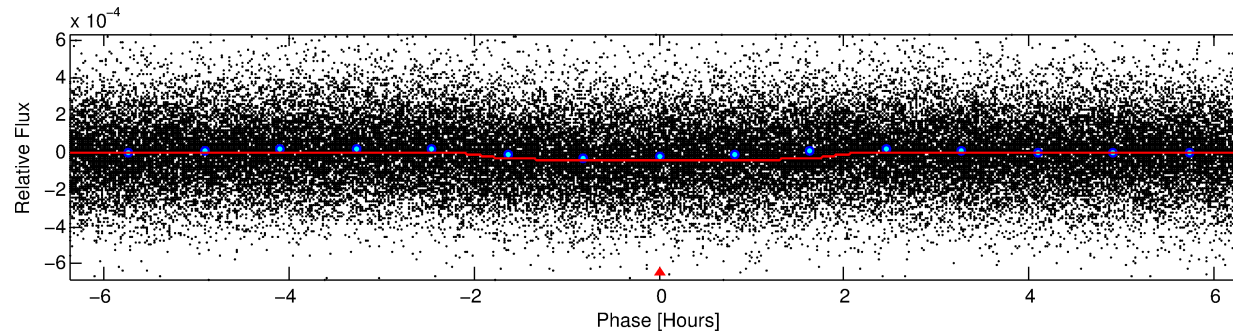
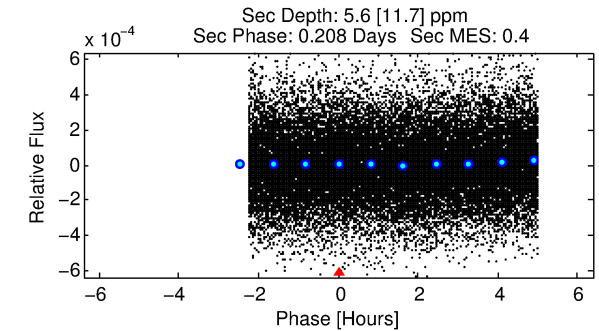
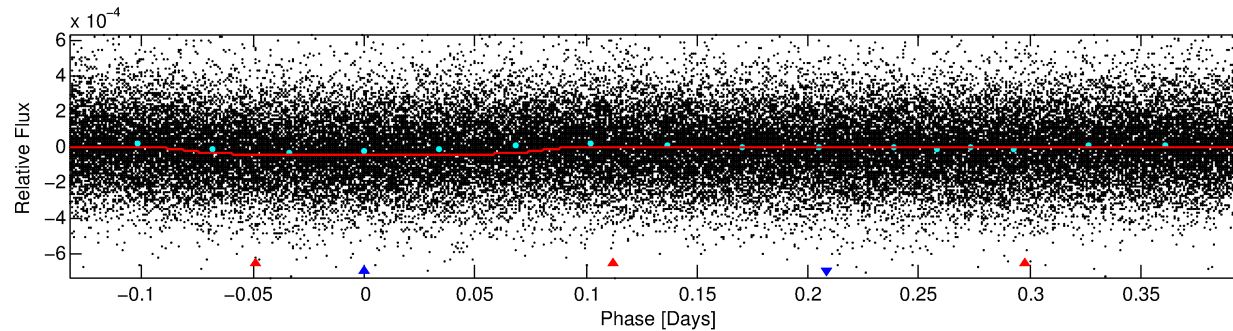
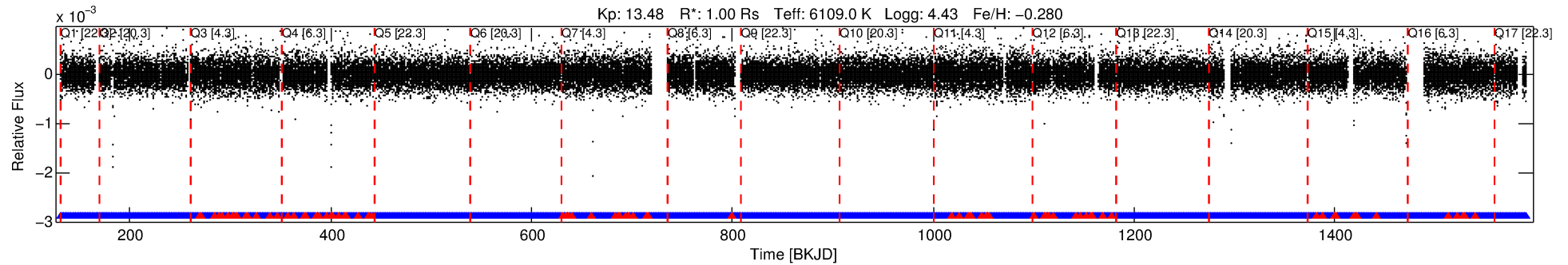
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012166874-02

No Significant Match Found

DV One-Page Summary

KIC: 12166874 Candidate: 2 of 2 Period: 0.532 d



DV Fit Results:

Period = 0.53164 [0.00001] d
Epoch = 131.6428 [0.0017] BKJD
Rp/R^{*} = 0.0069 [0.0018]
a/R^{*} = 1.05 [0.13]
b = 0.90 [0.31]
Seff = 7672.04 [3030.78]
Teq = 2386 [236] K
Rp = 0.76 [0.31] Re
a = 0.0128 [0.0033] AU
Ag = 0.87 [1.91] [-0.07σ]
Teffp = 3562 [1936] K [0.60σ]

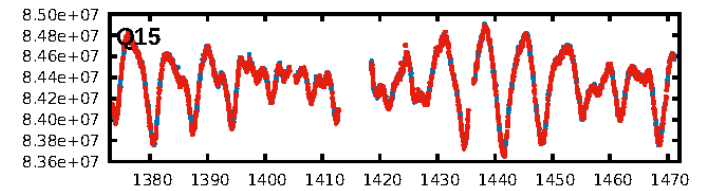
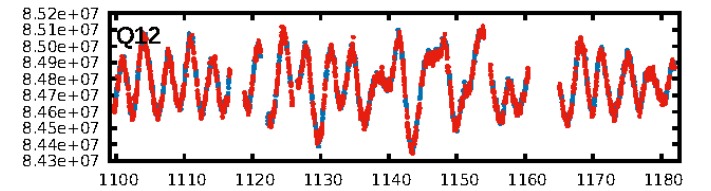
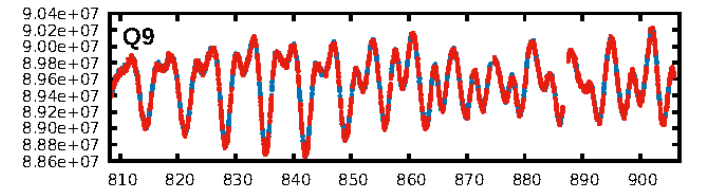
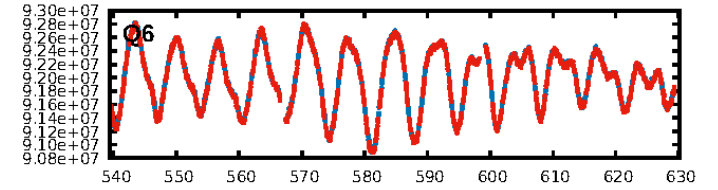
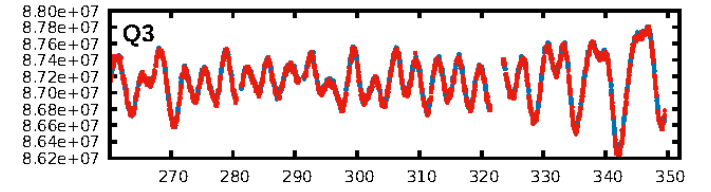
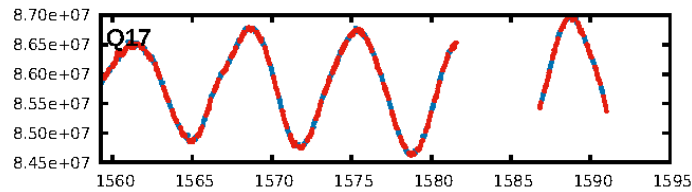
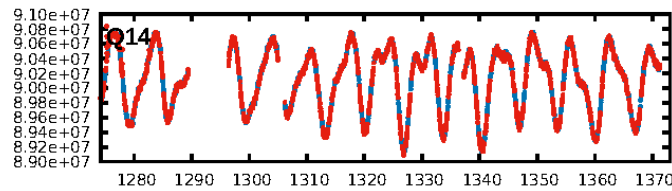
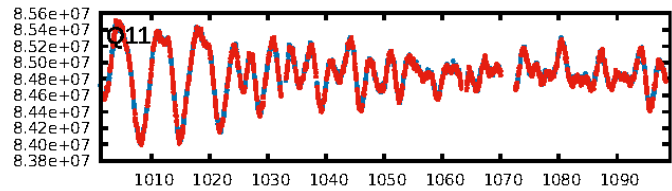
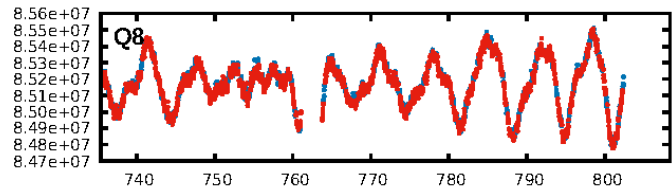
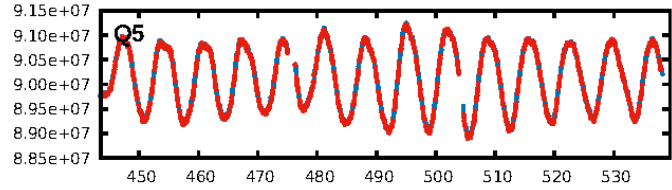
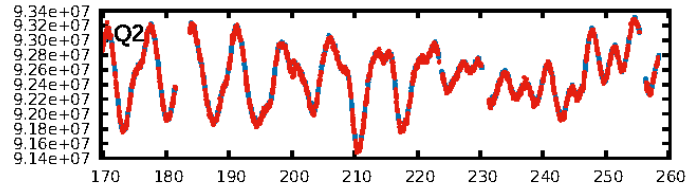
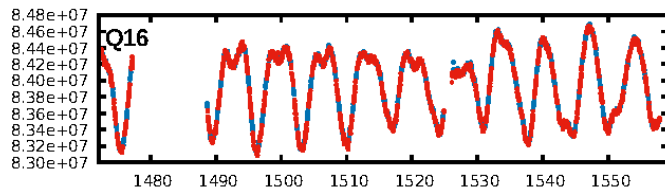
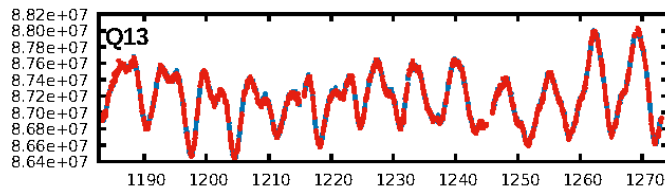
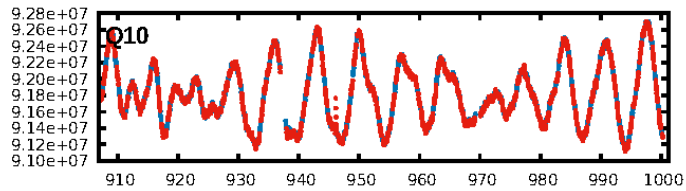
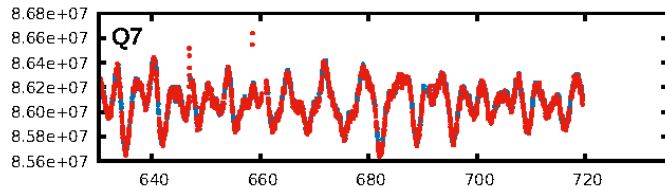
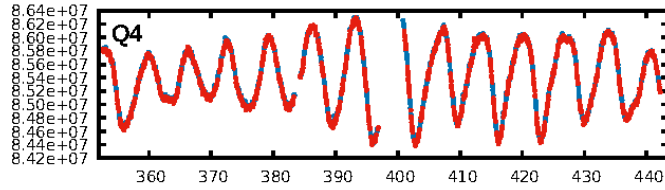
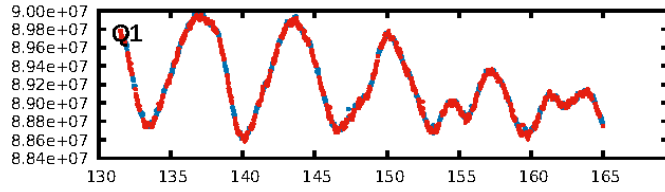
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [2077.98σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.97 [2333/2416]
GhostDiagnostic-chr: 1.438
Centroid-sig: 0.0%
Centroid-so: 1.552 arcsec [3.18σ]
OotOffset-rm: 0.410 arcsec [0.79σ]
KicOffset-rm: 0.348 arcsec [0.64σ]
OotOffset-st: 3/3/3/5 [14]
KicOffset-st: 3/3/3/5 [14]
DiffImageQuality-fgm: 0.86 [12/14]
DiffImageOverlap-fno: 1.00 [17/17]

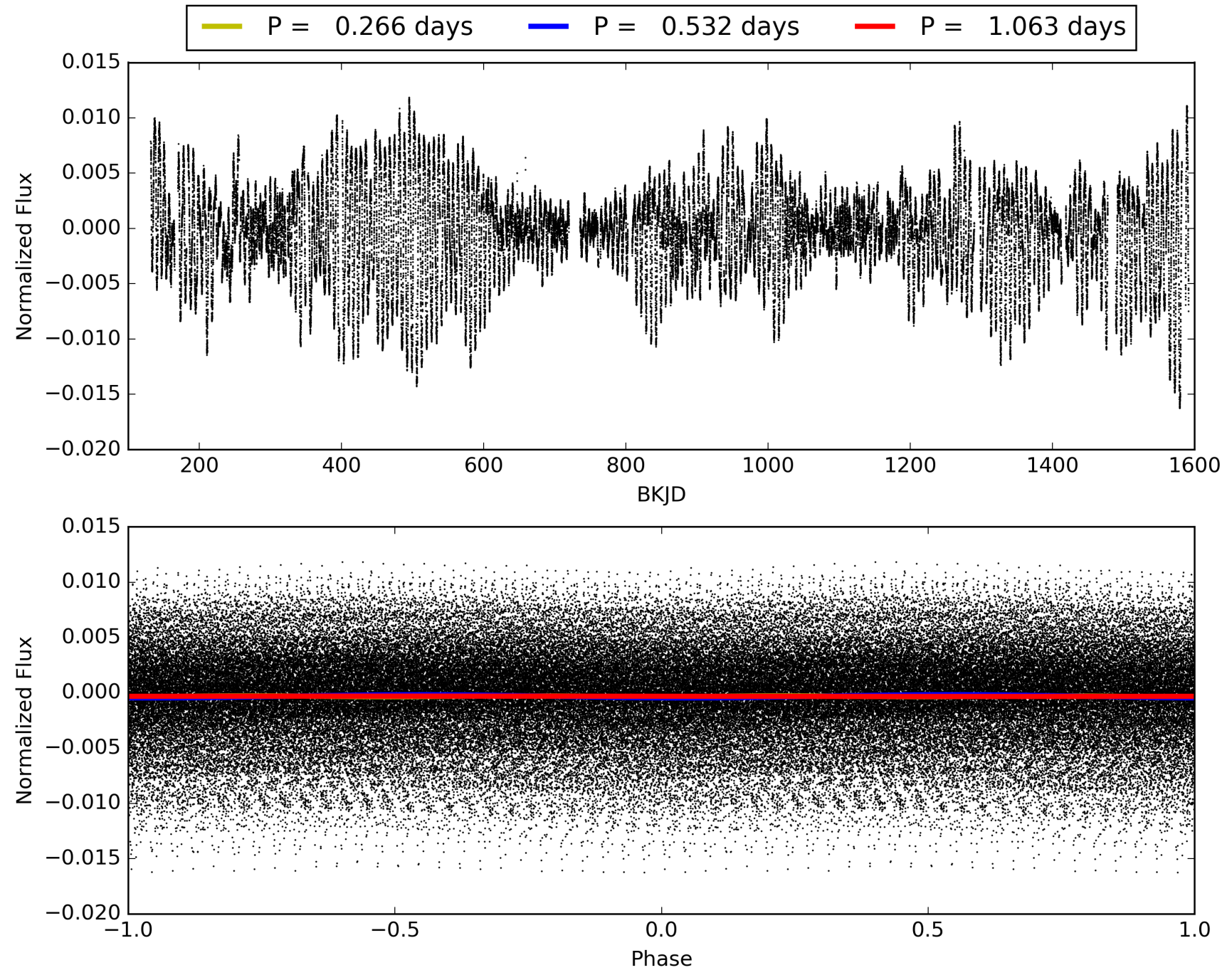
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 07:34:08 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 012166874-02, PDC Light Curves

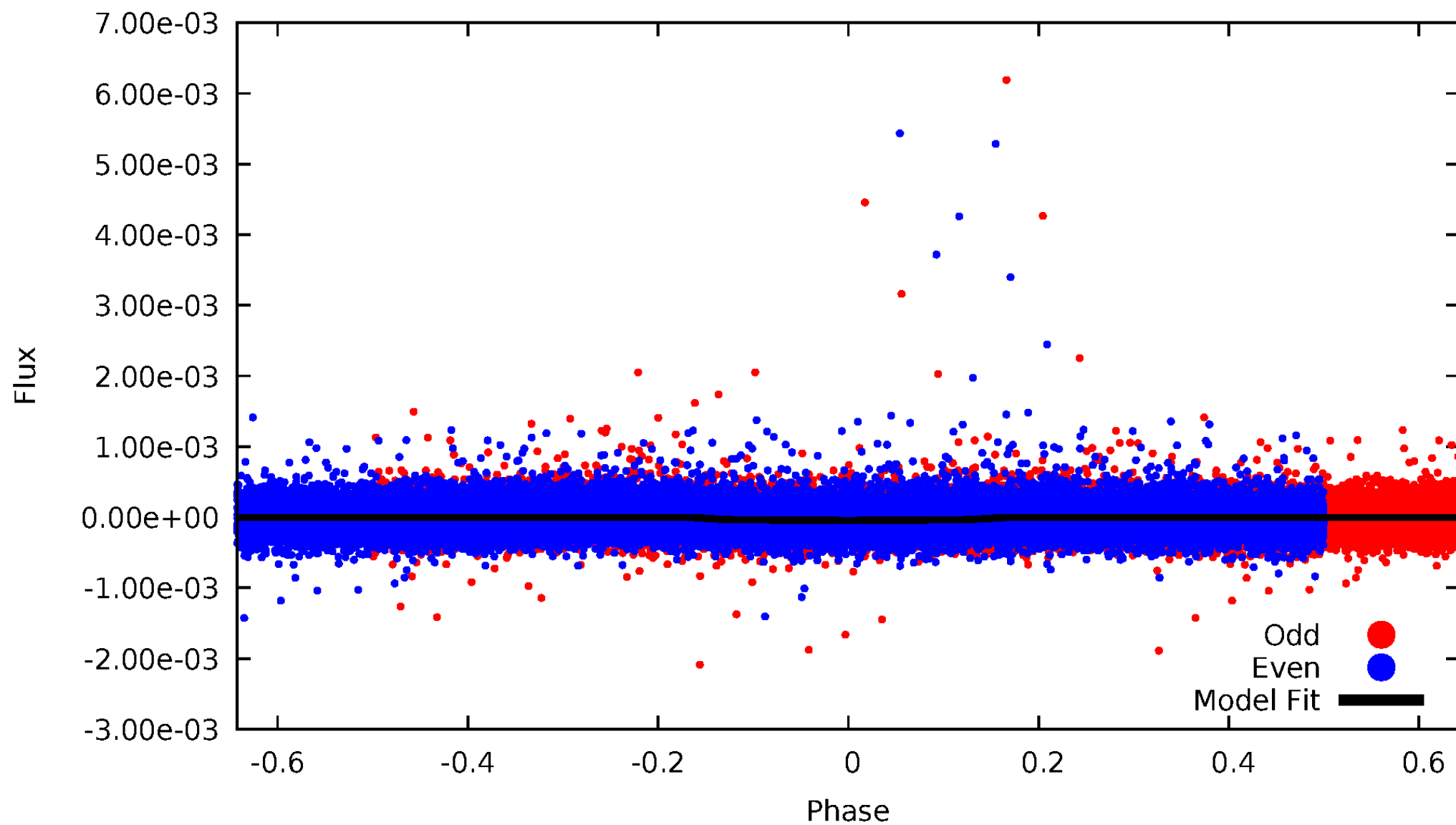


TCE 012166874-02



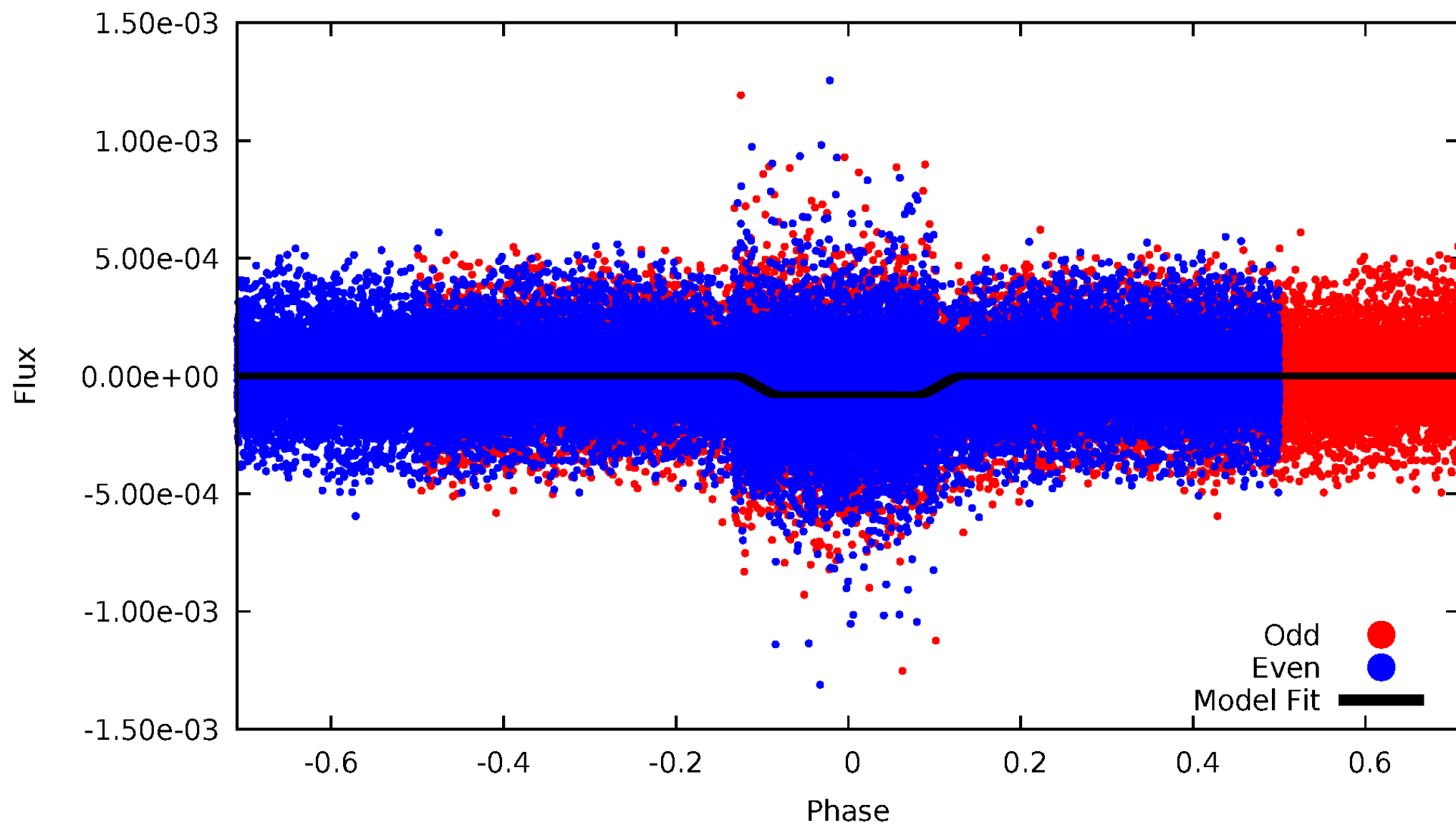
DV Odd/Even

TCE 012166874-02



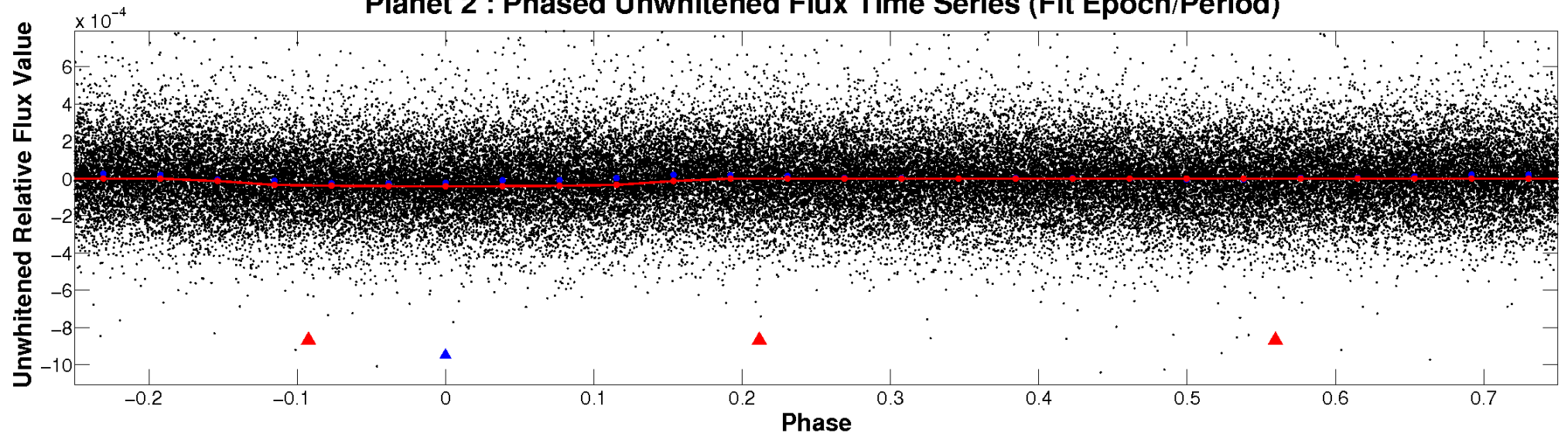
ALT Odd/Even

TCE 012166874-02

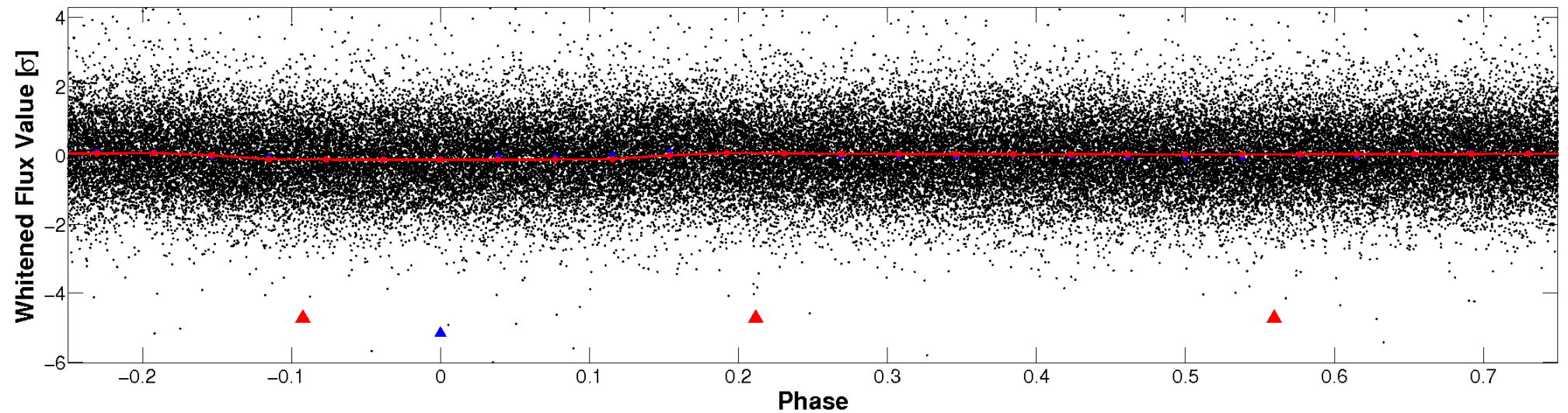


Non-Whitened Vs. Whitened Light Curve

Planet 2 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

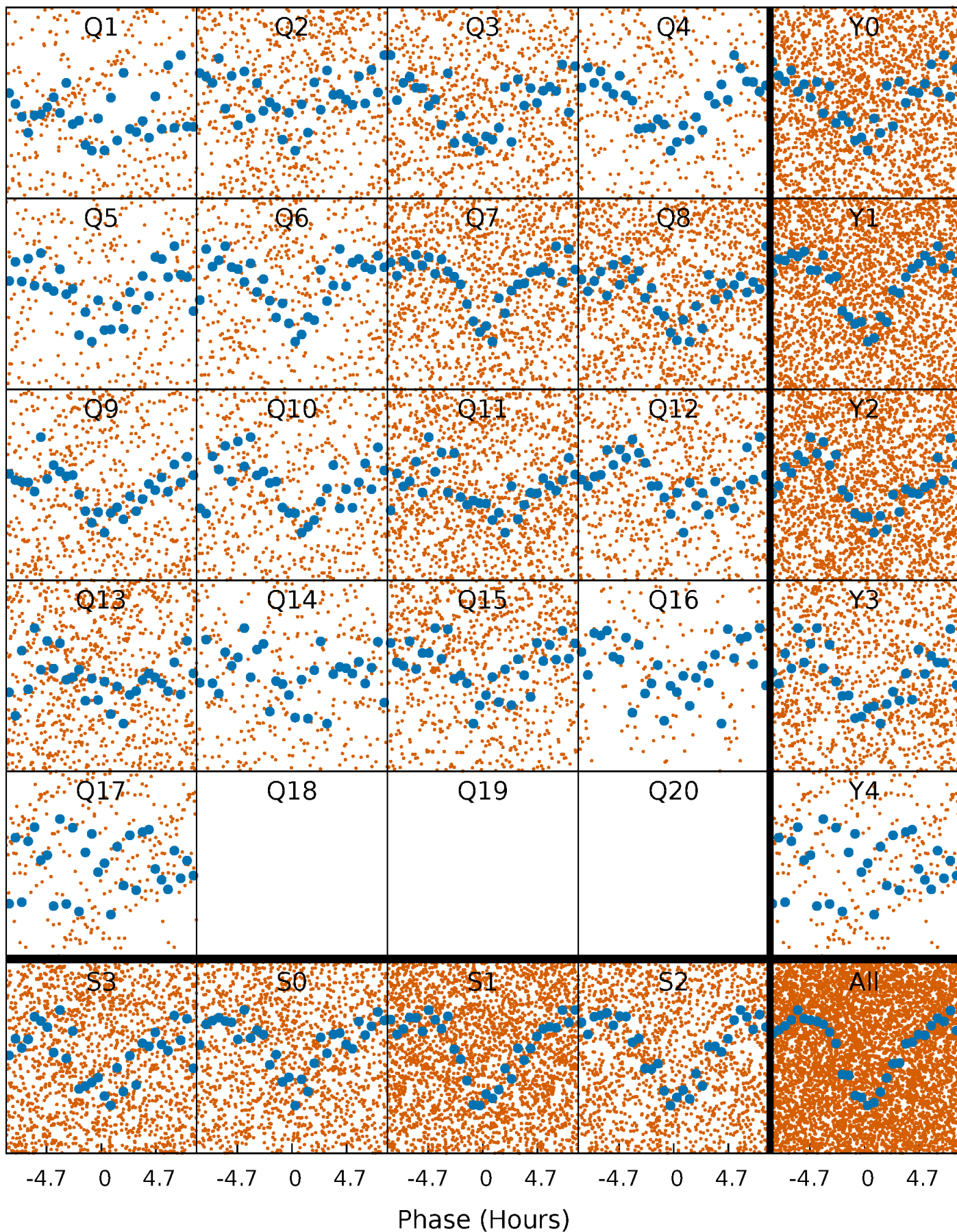


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



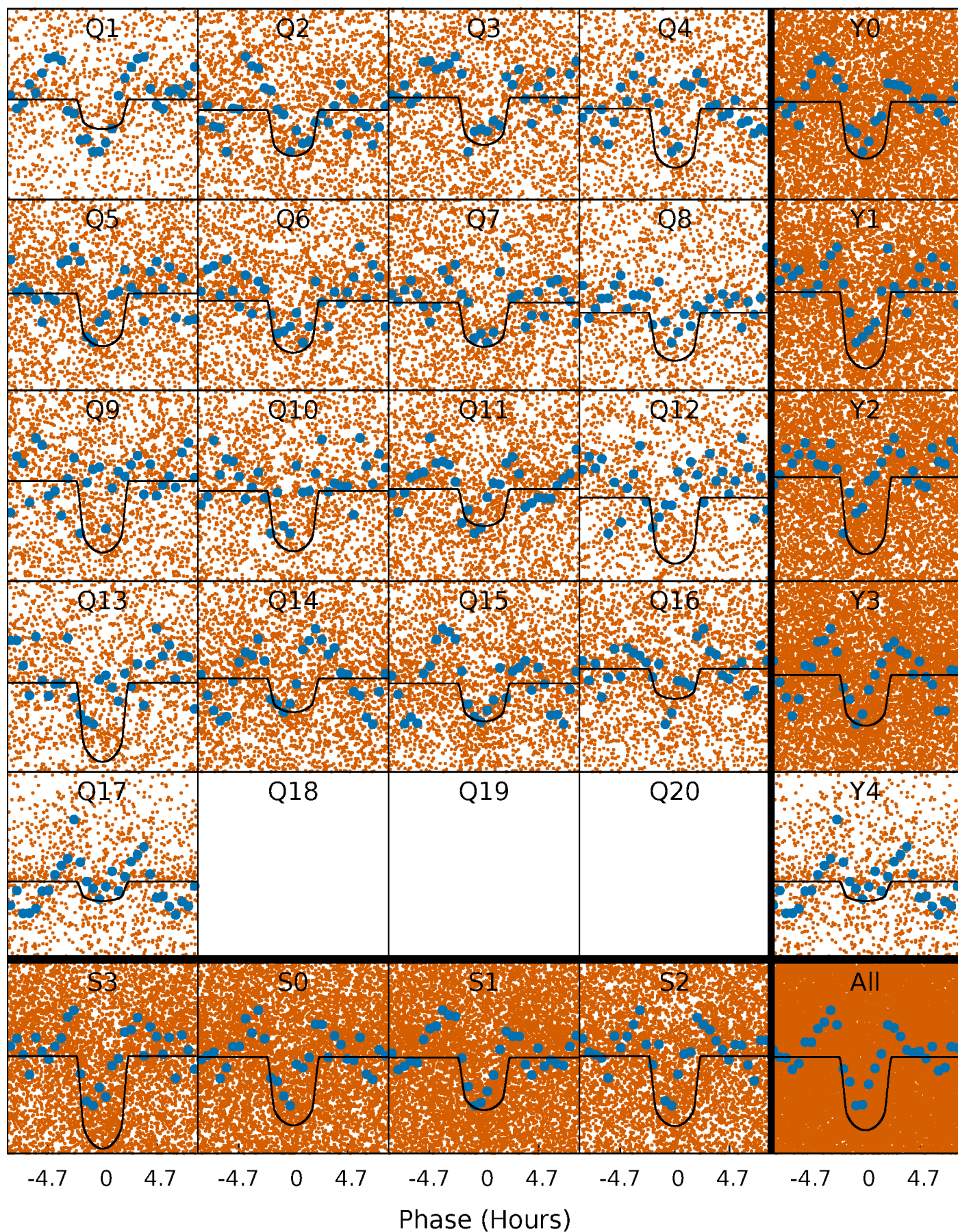
PDC Quarter-Phased Transit Curves

TCE 012166874-02 P= 0.531637 Days $T_0=131.642816$ (BKJD)



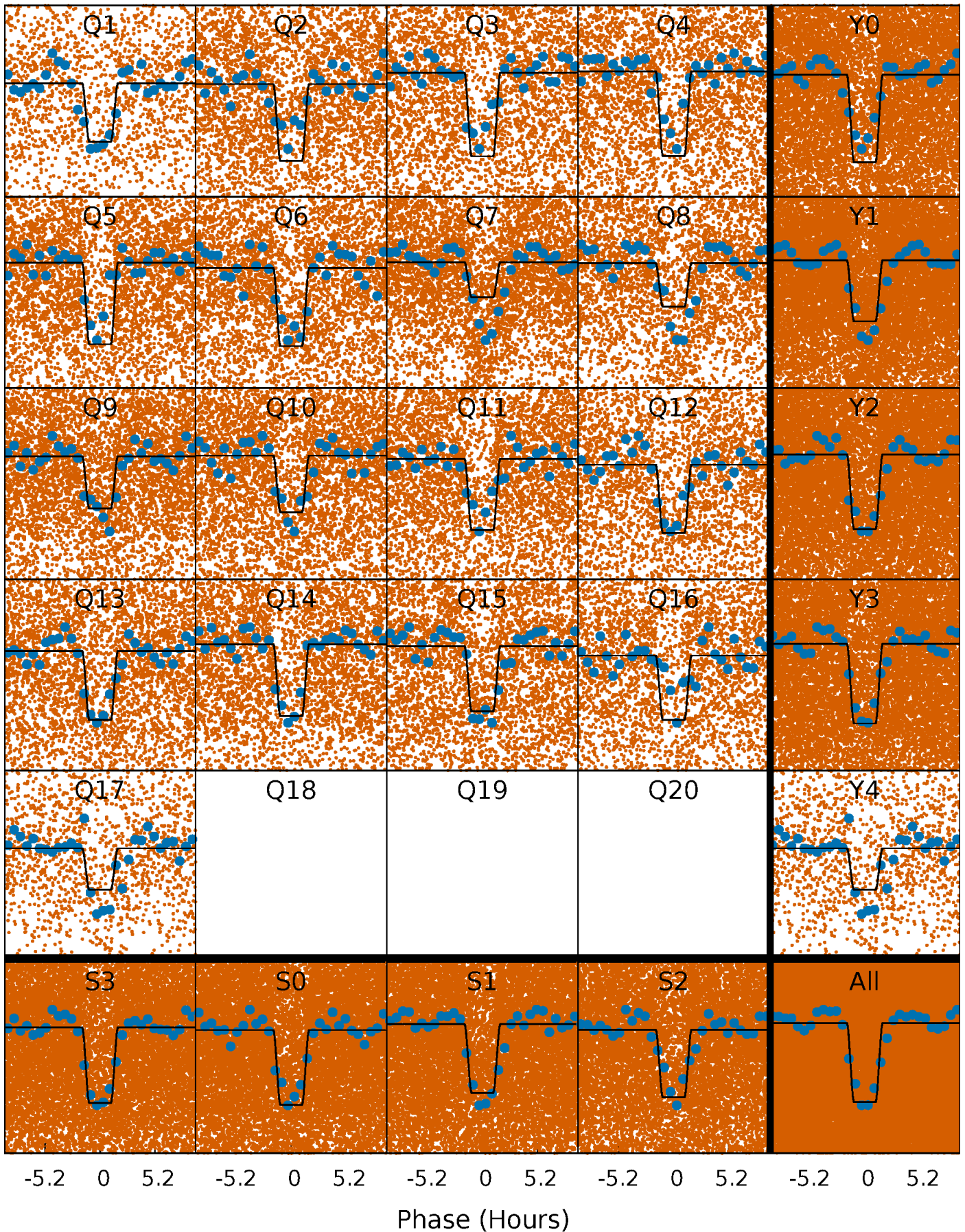
DV Quarter-Phased Transit Curves

TCE 012166874-02 P= 0.531637 Days $T_0=131.642816$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

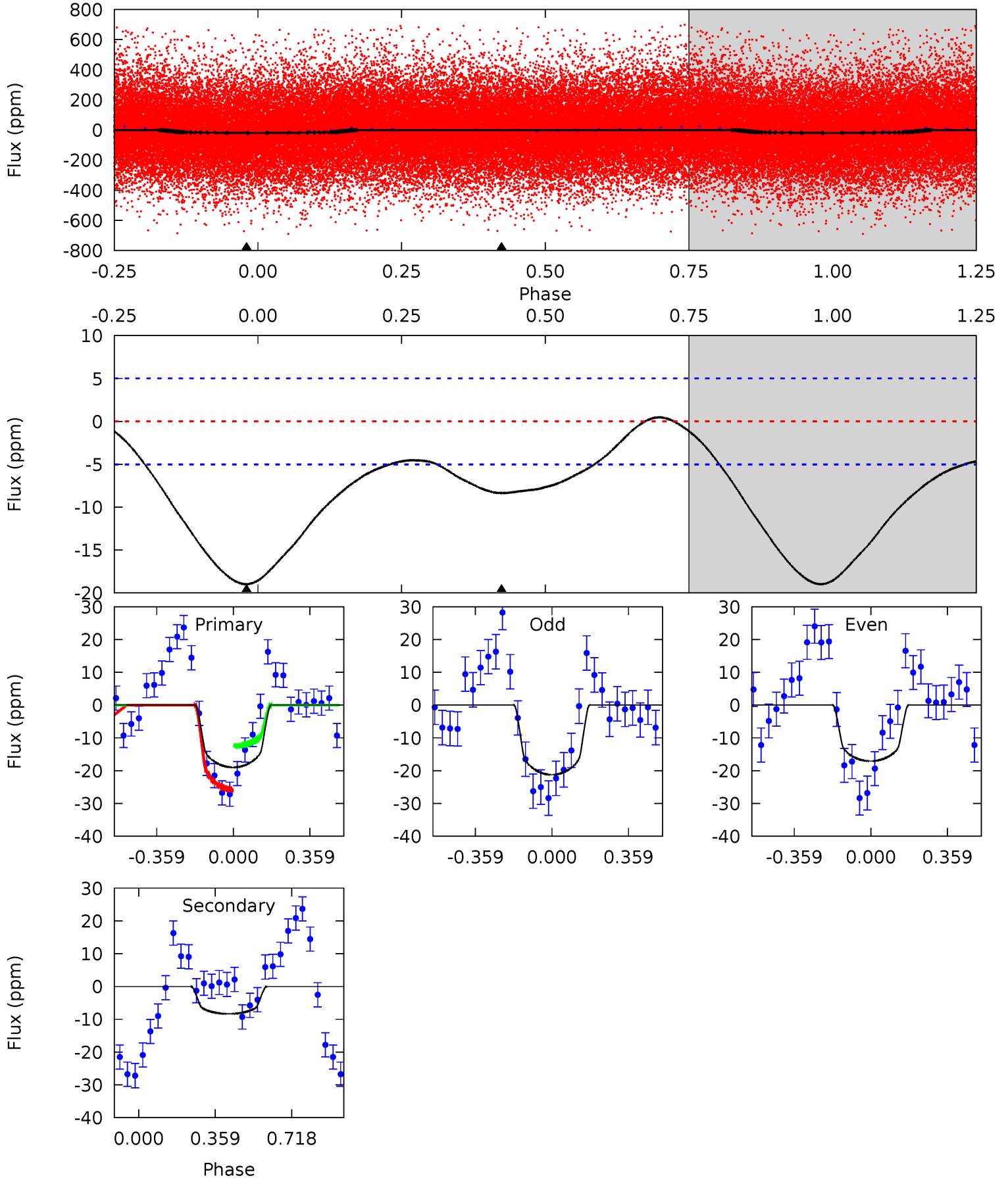
TCE 012166874-02 P= 0.531623 Days $T_0=131.642624$ (BKJD)



DV Model-Shift Uniqueness Test

012166874-02, P = 0.531637 Days, E = 131.111179 Days

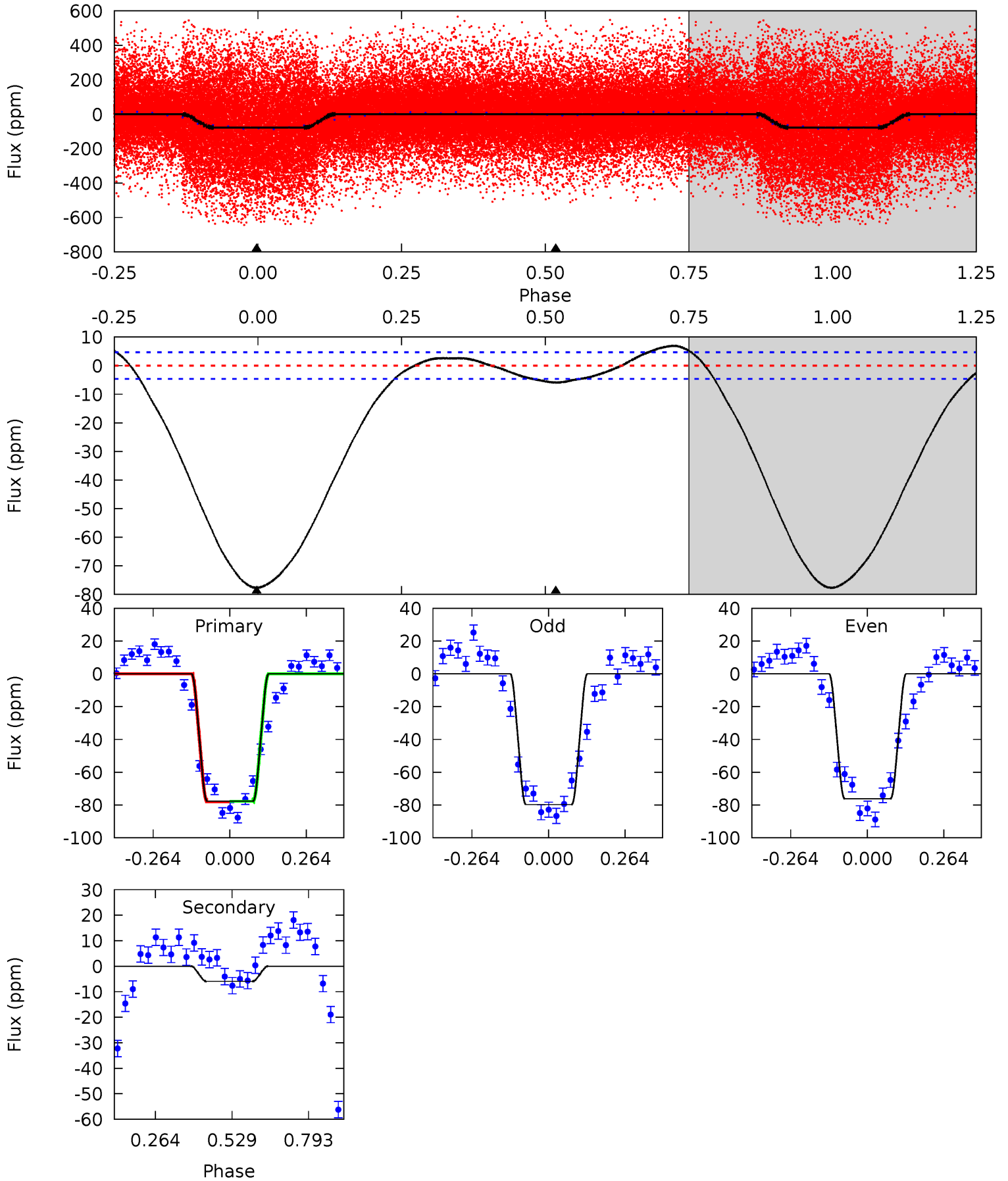
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.2	7.15	0	0	4.29	0.92	0.43	16.2	16.2	7.15	7.15	1.77	0.79	0.02	5.66



Alt Model-Shift Uniqueness Test

012166874-02, P = 0.531623 Days, E = 131.111001 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
72.6	5.53	0	0	4.36	1.12	3.41	72.6	72.6	5.53	5.53	1.64	1.03	0.08	0.13



Stellar Parameters For KIC 012166874

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6109^{+164}_{-200}	$4.429^{+0.087}_{-0.203}$	$-0.280^{+0.300}_{-0.300}$	$1.001^{+0.307}_{-0.131}$	$0.979^{+0.141}_{-0.116}$	$1.377^{+0.523}_{-0.732}$
	+3%/-3%	+2%/-5%	+107%/-107%	+31%/-13%	+14%/-12%	+38%/-53%
Source	PHO1	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 012166874-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-8 ± 1	$0.79^{+0.24}_{-0.22}$	3376^{+266}_{-190}	3951^{+657}_{-476}	$1.183^{+1.181}_{-0.500}$
Alt.	-6 ± 1	$1.00^{+0.26}_{-0.21}$	3369^{+225}_{-187}	3144^{+466}_{-767}	$0.514^{+0.346}_{-0.192}$

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming A=0.3)

A_{obs} = Observed Albedo (Assuming T=0)

If a secondary eclipse is present, the system is likely an EB if $T_{\text{obs}} \gg T_{\text{max}}$ AND $A_{\text{obs}} \gg 1.0$

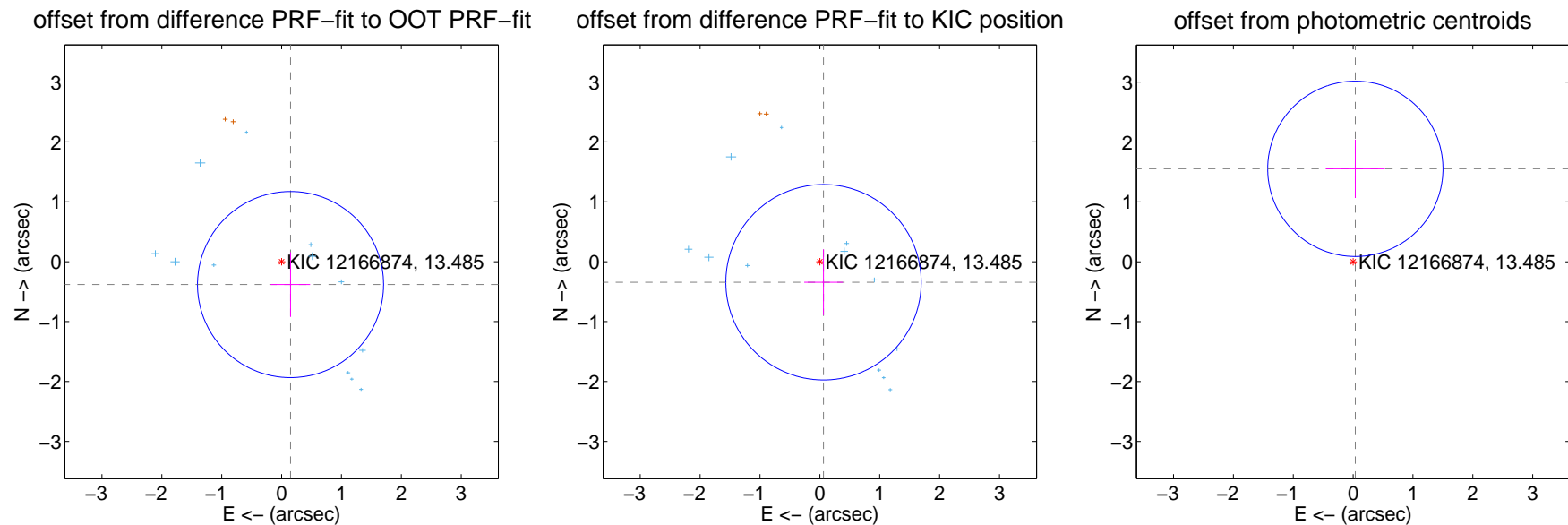
DV Centroid Data

Supplemental centroid analysis for 012166874-02. Kepler magnitude: 13.48. Transit SNR 18.10

There are 12 quarters with good PRF difference image offsets

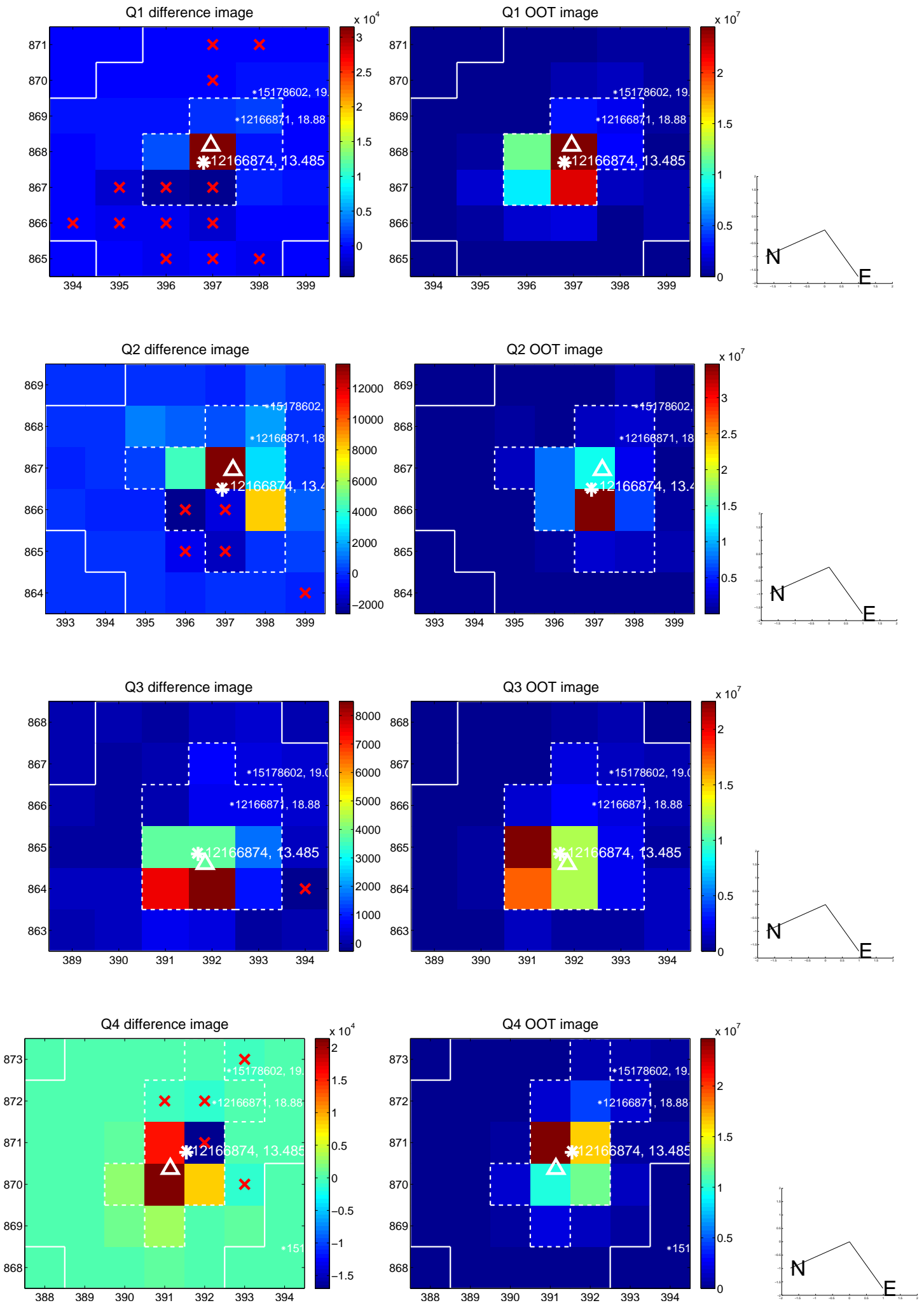
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.410 ± 0.518	0.79	-0.150 ± 0.328	-0.382 ± 0.541
PRF-fit source offset from KIC position	0.348 ± 0.544	0.64	-0.061 ± 0.323	-0.343 ± 0.549
photometric centroid source offset	1.55 ± 0.49	3.18	-0.04 ± 0.49	1.55 ± 0.49

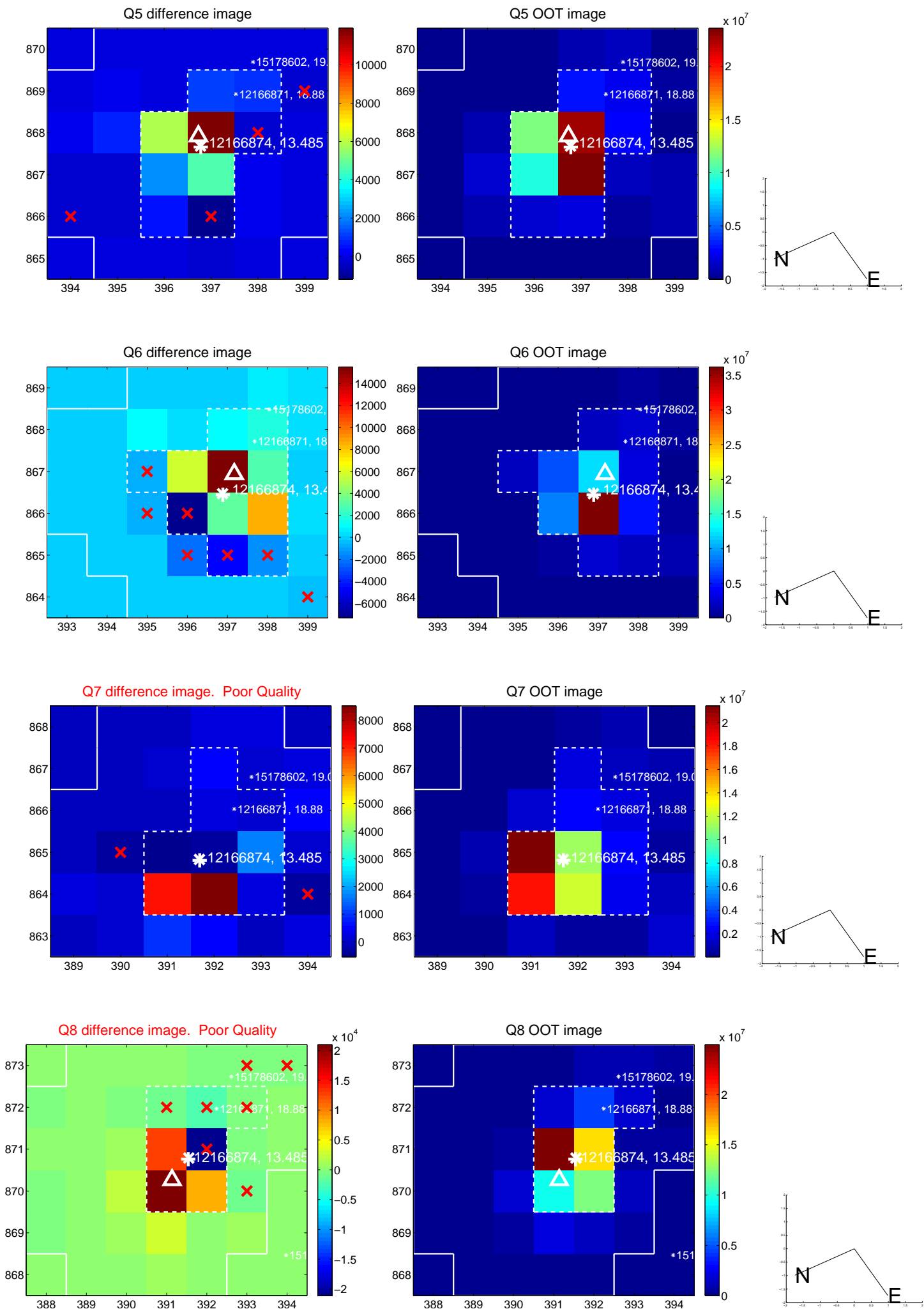


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

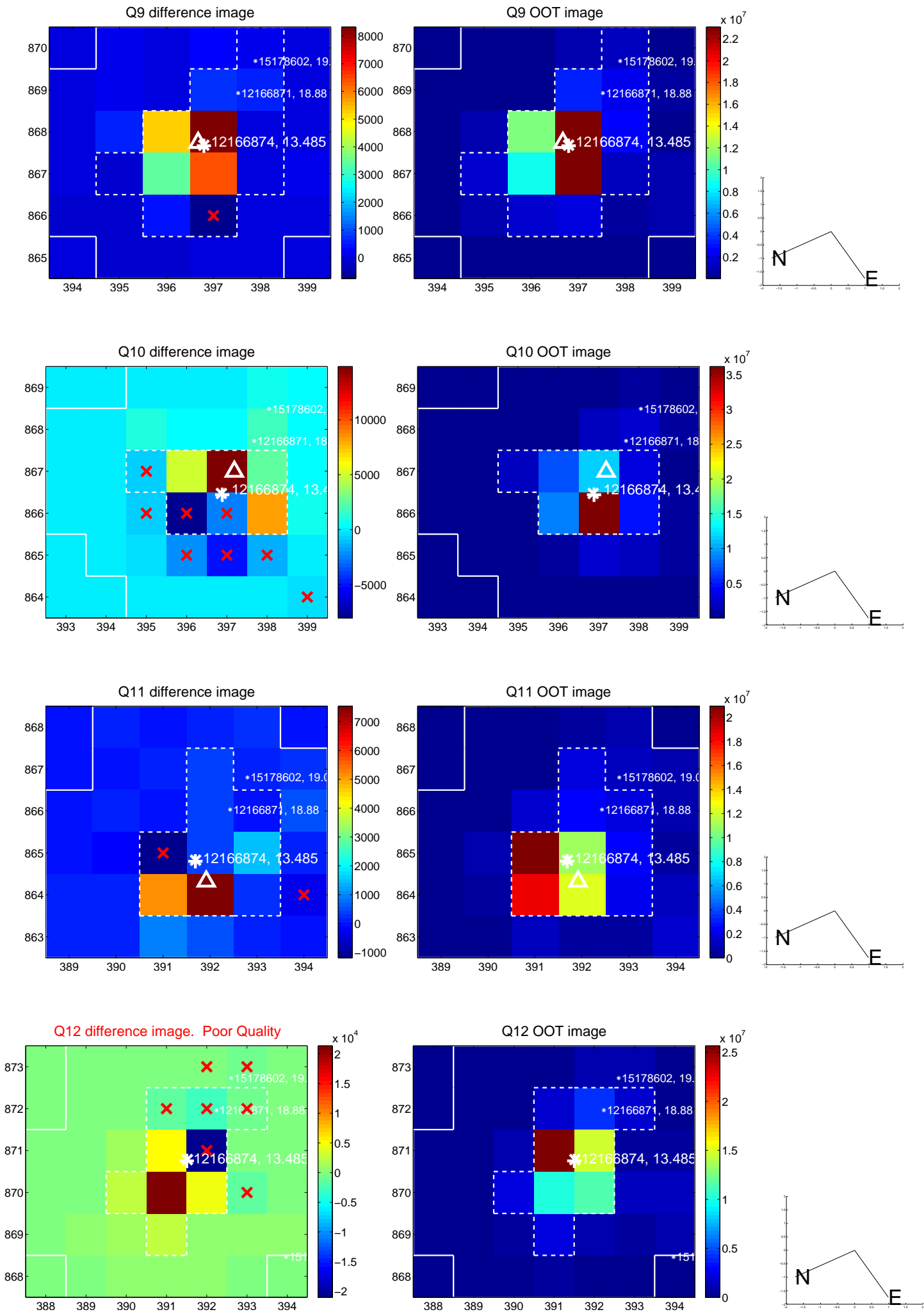
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



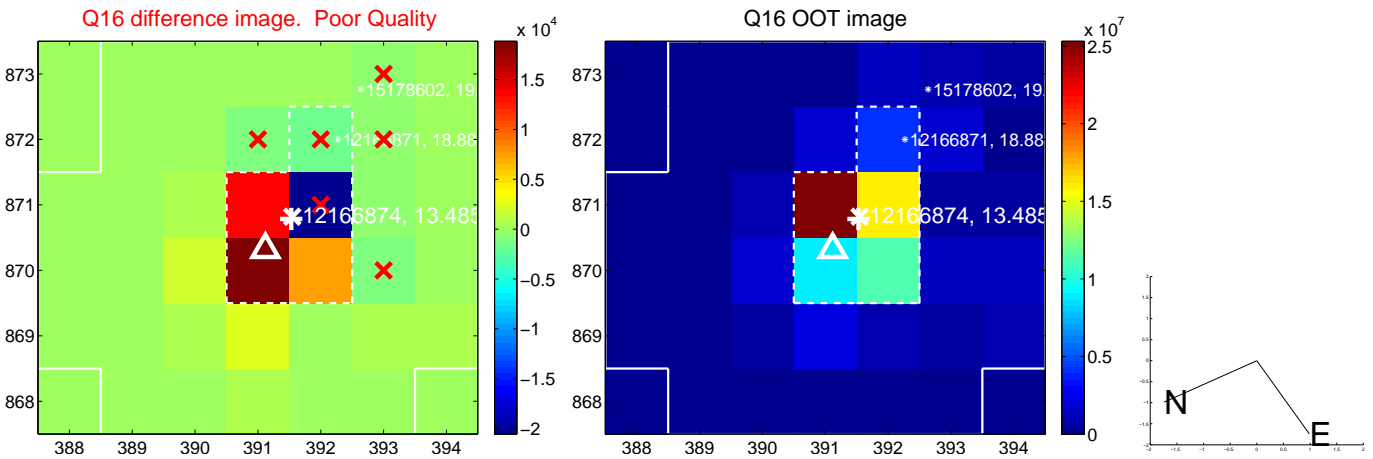
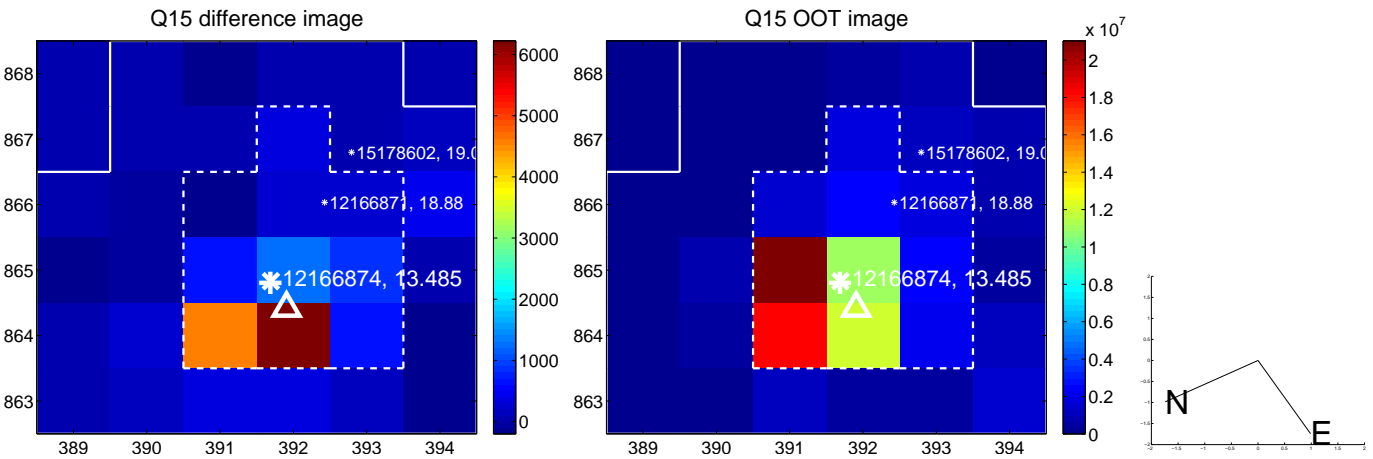
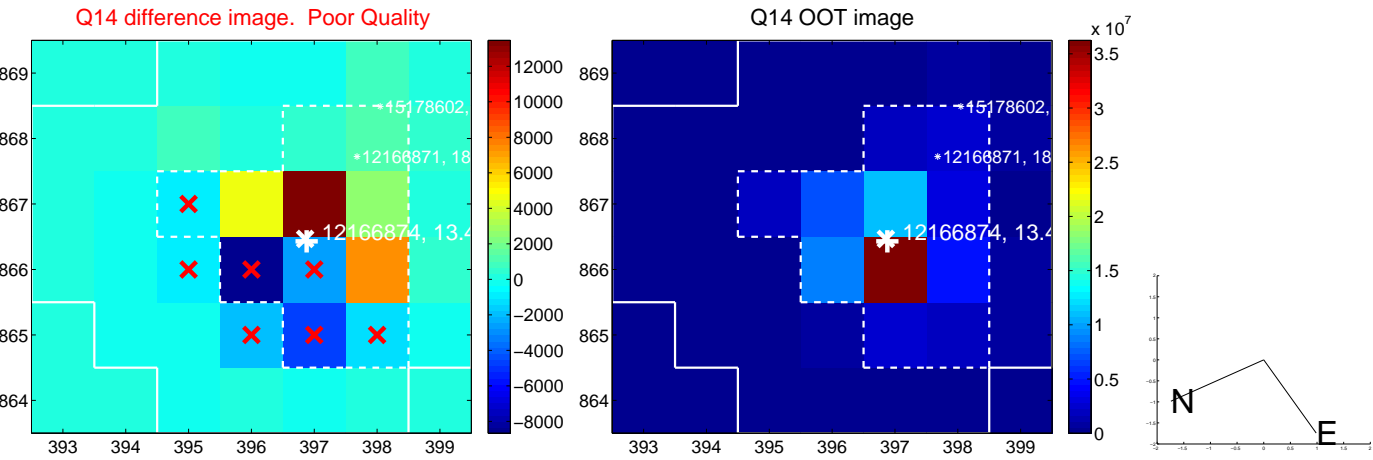
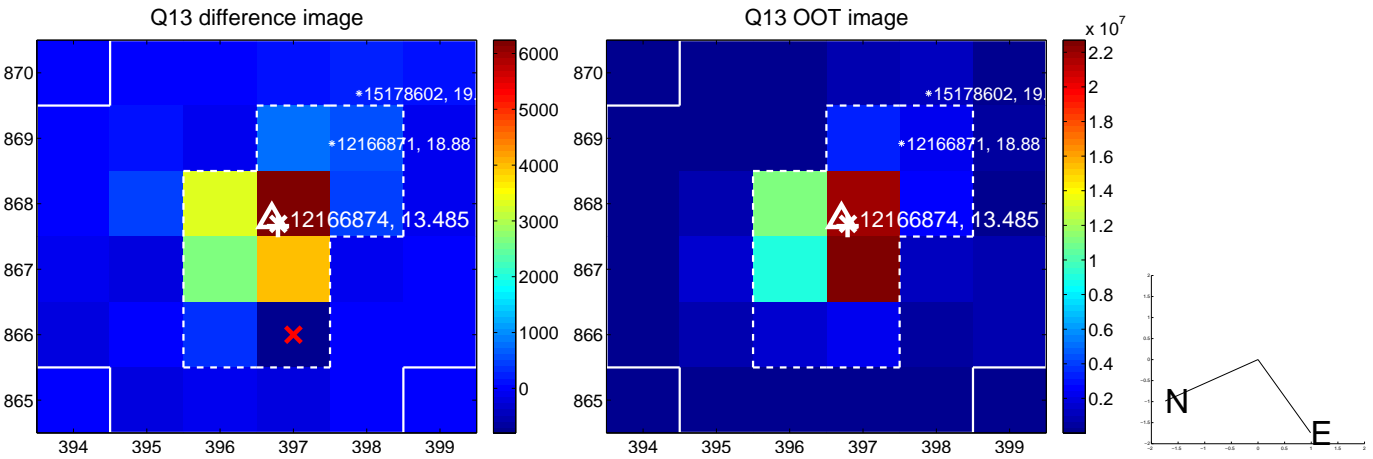
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



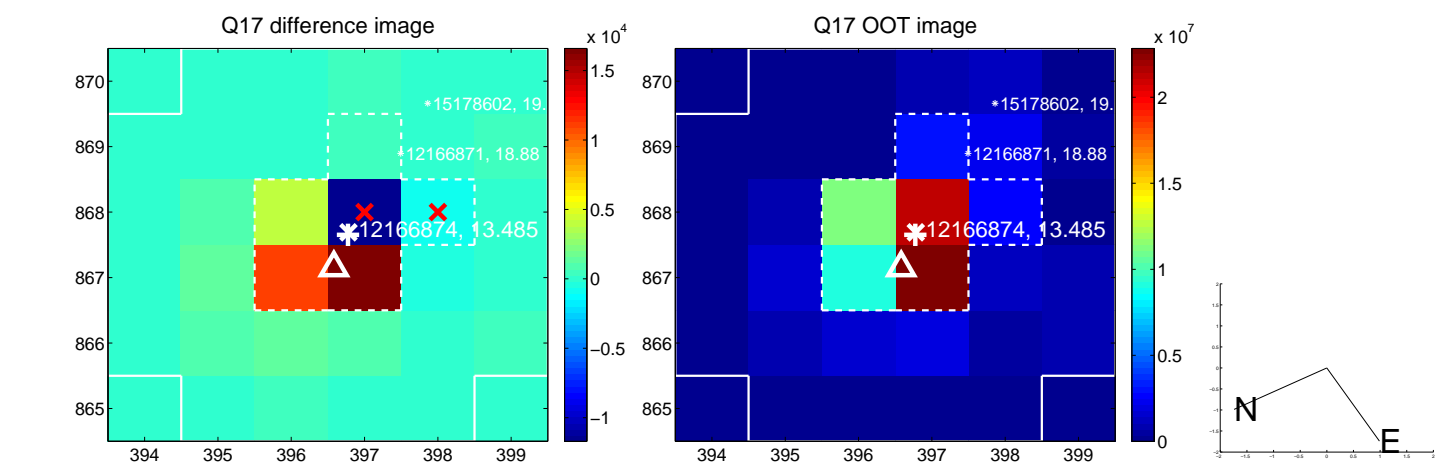
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



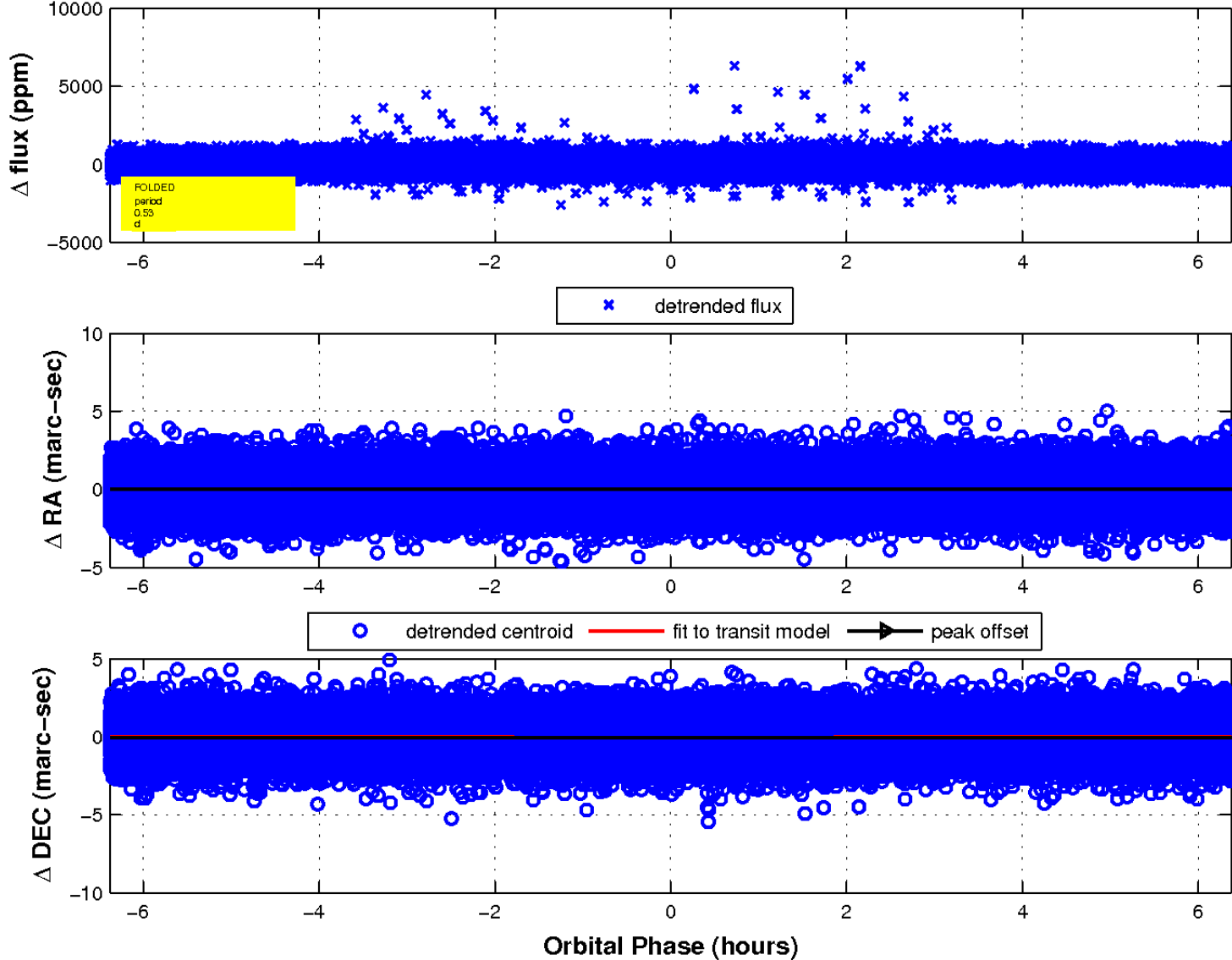
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

